Annual Oil and Gas Activity in Arizona 1959 to 2014

Compiled by

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1960 - Oil and Gas Compact Bulletin, v. 19, no. 1, June 1960, p. 60-62. By D.A. Jerome, Executive Secretary, Arizona Oil and Gas Conservation Commission

The Arizona Senate, pursuant to statutes, confirmed the members appointed to the Oil and Gas conservation Commission in March of this year and the following is a list of the members and their places of residence in the State of Arizona.

R. Keith Walden	Ernest Chilson
P.O. Box 359	Bar T Bar Ranch
Nogales Star Route	P.O. Box 190
Nogales, Arizona	Winslow, Arizona
Anthony T. Deddens	
P.O. Box 600	
	P.O. Box 359 Nogales Star Route Nogales, Arizona Anthony T. Deddens

There seems to be a great interest in Arizona helium deposits, and we presently have 10 shut-in helium wells.

We are informed and believe that a helium plant will be built this year by either Kerr-McGee Industries, Inc., or by Western Petroleum Company at Pinta Dome, Apache County, Arizona. These two companies presently own the shut-in helium wells at Pinta Dome.

Arizona looks forward to numerous additional helium wells being drilled in the Pinta Dome area.

Arizona contemplates considerable drilling in Apache County on the Navajo Reservation, these said wells to be drilled for oil and/or gas, or both.

Mohave County and Cochise County have indications of being areas of special interest in Arizona and further drilling is contemplated.

We feel that Arizona oil and gas possibilities are very favorable, and we are looking forward to having companies spend some of their exploration money in the virgin territory.

ARIZONA ACTIVITY

Permit No.	Company Name Ma	ajor	Independ.	County	Product.	Effe Dry	ctive June 1, 1960 Testing Drilling Shutdown
103	John Hatchett		*	Cochise			*
104	Richard Donnelly		*	Cochise		*	
105	British American						
	Oil Refining Co.	*		Apache		*	(water well)
106	Texas Pacific Coal						
	& Oil Co. #2		*	Apache			*
107	Eastern Petroleum Co.		*	Apache		*	
108	Eastern Petroleum Co.		*	Apache		*	
109	Eastern Petroleum Co.		*	Apache		*	
110	Crest Oil Company		*	Apache		*	
111	Richard Donnelly		*	Cochise		*	
112	Crest Oil Company			Apache			*
113	Texaco Inc.	*		Apache			*

114	Tennessee Gas					
	Transmission Co.	*		Mohave	*	
*115	Texas-Pacific Coal					
	& Oil Co. #3		*	Apache		*
*116	Texas-Pacific Coal					
	& Oil Co. #4		*	Apache		*

ARIZONA PRODUCTION DATA

Cumulative through 1- Company El Paso Natural Gas Company	<u>1-60</u> <u>Well</u> Bita Peak	<u>Field</u> Bita Peak	Initial Production 20,878 MCF / Gas 1,000 Bbl Condensate	Production Shut-in	Remark
Franco Western Oil Company	Navajo #1	Toh-Ah-Tin	7,450 MCF / 18 Bbl Distillate	Shut-in	
Humble Oil & Refining Company	E-1 Navajo	E. Boundary Butte (undesignated)		, , , , , , , , , , , , , , , , , , , ,	Shut-in High GOR
Humble Oil & Refining Company	Navajo #1	E. Boundary Butte (undesignated)	8,200 MCF / 47 BD 37.9°	Shut-in	Shut-in High GOR
Shell Oil Company	Navajo Tribal #23-11	E. Boundary Butte (undesignated)	104 BD 195 440 A.P.I 775 MCF	9 1,257 BD 7020 MCF Flared	Shut-in High GOR
Shell Oil Company	Navajo Tribal #2	E. Boundary Butte (undesignated)	3,150 MCF / 11 Bbl Oil	1954 thru 1958 Shut-in 63,222 MCF None – 1959	Gas used to drill well in Utah
Superior Oil Company	Navajo Tribal H-2	Un-named	12,500 MCF / 125 Bbl 64.6° A.P.I. Distillate	Shut-in	
Texas Pacific Coal & Oil Company	Navajo Tribal #138-1	Dry Mesa	240 BPD 40.6° A.P.I. / 43.8 MCF Gas	Aug. thru Dec. 1959 – 24,983 E	 Bbl
Shell Oil Company	Navajo Tribal	E. Boundary Butte (undesignated)	Gas	4,856 MCF 195	4 Plugged and Abandoned

Note: All Production located on the Navajo Indian Reservation in Apache County.

1960 - Oil and Gas Compact Bulletin, v. 19, no. 2, December 1960, p. 31-33. By D.A. Jerome, Executive Secretary, Arizona Oil and Gas Conservation Commission

Drilling and exploration for oil and gas in Arizona during 1960 has not reached the expectations forecast earlier in the year. A general decline, nationwide, in footage drilled and fewer wildcat wells, naturally reduced the total tests in Arizona.

Unfavorable results in some of the wells drilled "cooled" the play in a specific area. Failure of the Tennessee Gas wells in Mohave County, Arizona, and the J. Ray McDermott well in Kane County, Utah, to produce decidedly reduced the activity in the "strip country" for 1960. We do have high hopes for this area in early 1961. We are informed and believe that five wells are in the planning stage and are to be drilled by reputable companies who can drill and test in a proper "oil patch" manner, including all the latest technology.

It appears that uncertainty in the manner of opening the North Kaibab National Forest to leasing and exploration caused several oil companies to slow down their exploration program. We believe this situation will be corrected and anticipate several test wells in this area during 1961.

At present the Navajo and Hopi tribes are litigating their boundary dispute in the Black Mesa Basin, which was heard this fall by three Federal Judges. After they render a decision, in all probability one of the parties may appeal the decision to the Supreme Court. Should an appeal be lodged, it may be several years before this controversial area will be open to exploration. Indirectly, this situation is retarding drilling in the Four Corners area. Companies do not wish to prove up sections near the disputed part of the state, thereby increasing lease costs, when the dispute is settled.

In the Four Corners area, progress has been made. Texaco brought in a small Devonian producer, near the Arizona-New Mexico line. Also in this well, Mississippian helium gas, 6 per cent, was found. This well is significant when one considers the importance of helium in this nuclear age. Texas Pacific drilled three more Dry Mesa Field wells, 2 producers, 1 dry hole. Dry holes by Humble, British-American and Superior have not deterred drilling in this section. With the exception of British-American, the wells were development wells. The excellent possibility of an intrastate gas transmission line from this area to the central part of the state, using Arizona gas for Arizona industry, should give companies active in that section an added incentive to enlarge their proven reserves and/or find new pools. A line would be building now if enough proven reserves had been available. Arizona has the market for all the oil and gas in can produce. Capital for refineries, pipelines, and marketing facilities is available when production is obtained in the desired amounts.

As expected, the Pinta Dome helium field was most active. With 19 permits issued, 12 wells have been drilled, and 2 are producers, or are reported to be producers. Ten dry holes do not present a favorable picture for this area until one considers that most of these wells were drilled to delineate the structure for geological information. Some of these wells are reported to have had considerable helium gas shows which will ultimately be produced from structurally higher wells. Presently, Crest Oil has found production in another structure east of Pinta Dome. It is not known at this time if the two structures are a common reservoir. Many more wells are scheduled for this area and additional reserves should assure the construction of a helium processing plant in this section of the state.

The Arizona Oil and Gas Conservation Commission held its first hearing on September 28, 1960, a petition by Kerr-McGee to establish drilling units for the Pinta Dome Field, of 640-680 acres. Resolving the Navajo-Hopi boundary dispute will increase drilling activity, because approximately five million acres of the south part of the reservation, i.e., Black Mesa Basin, has bee filed on by various companies and individuals who are desirous of drilling.

In southeast Arizona, the expected drilling has not materialized at this time. Several prospects may be started in December. There has been a recent lease play by several prominent oil companies, and we are informed and believe that there will be several wells drilled in this area in 1961.

Lease acreage in the state has dropped during 1960. Much of the acreage now under lease has been blocked up at a greatly increased cost over the 1958 and 1959 leases, when a great many of the cheap leases at 25 cents per acre were picked up by speculators.

To date, 34 applications have been issued by the Arizona Oil and Gas Conservation Commission. A breakdown of these applications as compared to 1959 is shown on the attached addenda as well as two plats of the active areas of the state. Arizona has a great future for companies in the oil and gas business, and our favorable tax structure is a great incentive. We offer a healthy growth environment and we will help you grow with us.

	PER.	MITS	COMPLETIC	NS 1960	
<u>COUNTIES</u>	<u>1959</u>	<u>1960*</u>	<u>Active</u>	<u>Dry</u>	PRODUCERS
Apache	21	28	9	14	5
Cochise	4	2	1	1	
Coconino	2				
Mohave		2	1	1	
Navajo	8	1		1	
Yavapai		<u>1</u>	<u>1</u>		
	36	34	12	17	5

29% successful wells to date

^{*}to December 1st, 1960

PERMIT				TOTAL		
<u>NUMBER</u>	NAME OF WELL	<u>SPUD</u>	COMPLETE	<u>DEPTH</u>	<u>POTENTIAL</u>	COUNTY
105	BR. AMER NAVAJO C-#1	Feb. '60	Apr. '60	6419	Dry – P & A	Apache
106	TEX. PAC. #138-2	Mar. '60	May '60	5771	40 oil-206 water	Apache
107	EASTERN PETR. SANTA FE #1	Mar. '60	May '60	1616	Dry – P & A	Apache
108	EASTERN PETR. SANTA FE #2	Mar. '60	May '60	1241	Dry	Apache
109	EASTERN PETR. SANTA FE #3	Mar. '60	Apr. '60	2932	Dry	Apache
110	CREST OIL. SANTA FE #2	May '60	June '60	1140	306 MCF Helium	Apache
111	RICHARD DONNELLY STATE #1A	Feb. '60	Mar. '60	1193	Dry	Cochise
112	CREST OIL. SANTA FE #1	May '60	May '60	1226	Dry	Apache
113	TEXACO NAVAJO TRIBE "Z" #1	May '60	July '60	6997	Oil & Helium	Apache
114	TENNESSEE GAS SCHREIBER #1	Apr. '60	May '60	4015	Dry	Mohave
115	TEX. PAC. NAVAJO #138-3	May '60	July '60	5411	16 oil-48 water	Apache
116	TEX. PAC. NAVAJO #138-4	Sept. '60	Oct. '60	5800	Dry	Apache
117	ROGER FIELDS FEDERAL #2	June '60			Dry	Mohave
118	HUMBLE OIL NAVAJO #2	July '60		6260	Dry	Apache
119	LAYRON WILSON-CODY HARRIS #1	June '60	Nov. '60	1270	Dry	Apache
120	SIERRA DRILLING STATE #1		Aug. '60	1047	Dry	Apache
121	SIERRA DRILLING STATE #2		Sept. '60	1016	Dry	Apache
122	SIERRA DRILLING STATE #3		July '60	1036	Dry	Apache
123	SIERRA DRILLING STATE #4		Sept. '60	1100	Dry	Apache

124	CREST OIL. SANTA FE #3	July '60	July '60	1282	Dry-P & A	Apache
125	WILSON/GRIFFEN HAGOOD #1					Apache
126	LYDIA JOHNSON TRUSTEE AZTEC #3	Aug. '60	Sept. '60	185	Dry-P & A	Navajo
127	KEY PETROLEUM #1-C					Cochise
128	SUPERIOR NAVAJO "M" #23-21	Oct. '60	Nov. '60	5991	Dry-P & A	Apache
129	CREST OIL. SANTA FE #5	Oct. '60	Nov. '60	1180	Dry-P & A	Apache
130	CREST OIL. SANTA FE #6					Apache
131	CREST OIL. SANTA FE #4					Apache
132	CREST OIL. SANTA FE #7					Apache
133	SIERRA DRILLING CAMPBELL #1	Nov. '60			Drilling	Yavapai
134	CREST OIL. SANTA FE #8	Nov. '60	Nov. '60		Reported Helium	Apache
135	LIN./STOLT. SUPERLOCK-WETZLER 1-13					Apache
136	LIN./STOLT. SUPERLOCK-WETZLER 1-21					Apache
137	LIN./STOLT. SUPERLOCK-WETZLER 1-31					Apache
138	WESTERN STATES NAVAJO TRIBAL #1	Oct. '60			Drilling	Apache
				64128		

1961 - Oil and Gas Compact Bulletin, v. 20, no. 1, June 1961, p. 23. By D.A. Jerome, Executive Secretary, Arizona Oil and Gas Conservation Commission

The drilling activity during the period from December 1, 1960, to May 31, 1961, did not measure up to expectations:

- There were nine permits issued of which six resulted in dry holes and three are currently drilling
- There were twelve permits issued prior to December 1, 1960, carried over into the period of this memo. Six are still locations, five resulted in dry holes and one was completed as a helium gas well.

The announcement by Kerr-McGee Oil Industries, Inc. of the construction of a helium processing plant in the vicinity of the shut-in helium wells has been a highlight of this period. Although no definite commencement date was set, it is thought it would get under way some time this summer.

The Commission anticipates revitalizing its 1959 Rules which were ruled out on a legal technicality. It is hoped that a public hearing will be held during the month of September on these.

1961 - Oil and Gas Compact Bulletin, v. 20, no. 2, December 1961, p. 26. By D.A. Jerome, Executive Secretary, Arizona Oil and Gas Conservation Commission

The Oil and Gas conservation Commission of Arizona is presently composed as follows:

R. Keith Walden, Chairman
Farmers Investment Company
288 South Stone Street
Tucson, Arizona

Lynn Lockhart, Vice Chairman
P.O. Box 217
Springerville, Arizona

Charles Kalil, M.D.
200 E. Monterey Way-Suite 6
Phoenix 12, Arizona

Robert B. Heward Orme Lewis

P.O. Box 427 Lewis, Roca, Scoville, Beauchamp & Linton

Holbrook, Arizona 9th Floor Title and Trust Building

Phoenix, Arizona

Kerr-McGee Industries, Inc. has completed their helium plant at Navajo, Apache County, Arizona which is the first privately financed and owned helium plant in the United States. They have nominated for their plant 1,700,000 cubic feet of raw gas per day and is presently on stream. There will be a formal dedication of this plant by Governor Paul Fanin of Arizona and other dignitaries on December 16, 1961.

There are six wells presently drilling in the State which include: 2 wells on the Navajo Indian Reservation in the 4 Corners area; one well in the vicinity of Springerville and one well in the Pinta Dome Region. There are several wells being drilled in Navajo County by the California Company and Julius Fohs respectively. In Yuma County, Keoughan Drilling Company is presently drilling below 5,000 feet.

We are informed and believe there will be wells drilled shortly in Yavapai, Pima and Cochise Counties. This is the greatest amount of drilling that there has been at one time in this State and it is significant that the wells are being drilled in various counties instead of being concentrated in one area.

The Oil and Gas Commission obviously anticipates that 1962 will exceed any previous years in the drilling of wells in Arizona.

The Arizona Oil and Gas Conservation Commission will hold a public hearing on its rules and regulations November 29, 1961 in the City of Phoenix at the Arizona Highway Department auditorium. There has been considerable interest evinced in this hearing by the industry.

In conjunction with the Arizona Development Board, the Arizona Oil and Gas Conservation Commission has prepared a very excellent brochure on oil, gas and helium in Arizona and this comprehensive booklet is available to the Industry upon request.

1962 - Oil and Gas Compact Bulletin, v. 21, no. 1, June 1962, p. 33. By D.A. Jerome, Executive Secretary, Arizona Oil and Gas Conservation Commission

To date, there have been 15 drilling permits issued, 13 wells drilled; 11 of the permits issued were for helium wells, 4 of the permits issued were for deeper wells; 2 wells are drilling as of June 12, 1962, 1 natural gas producer completed, 2 helium gas wells completed, 10 resulted in dry holes.

It is contemplated there will be 4 wells drilled in Cochise County in the latter part of 1962 and the activity in the helium area should continue at a fairly steady pace. The El Paso Natural Gas Company has extended its line to take gas from Shell Oil Company's Bita Peak #1 and it is contemplated that El Paso might tie into several of the shut-in gas wells owned by Humble, Superior, etc.

The Commission has issued 3,500 copies of its 109 page Oil, Gas and Helium in Arizona brochures and expect to distribute several thousand more of these in the ensuing months.

The general tone of the industry for the area is cautious optimism but with much interest being reflected.

1962 - Oil and Gas Compact Bulletin, v. 21, no. 2, December 1962, p. 19. By John K. Petty, Petroleum Geologist, Oil and Gas Conservation Commission

As of November 30, 1962, there have been 47 drilling permits issued. Presently, there are nine wells drilling, six locations on which no operations have begun, six completed helium wells, one flowing oil well with solution gas drive, three water wells and 22 dry holes.

Compared to 32 drilling permits issued during 1961, this is a 31.96% increase in only 11 months of this year.

The Kerr-McGee Helium plant, opened in December, 1961, at Navajo, Arizona, is operating efficiently, refining approximately one million cubic feet of raw gas (8% helium) per day.

The wells being drilled presently are in Yuma, Yavapai, Coconino, Maricopa, Navajo, Apache, Cochise, Pima and there is activity just across the State line in Utah from the Northwestern Arizona Strip Country.

A new gas line was built to two wells in the Four Corners by El Paso Natural Gas Company and oil lines were built to three wells in the same area by Four Corners Pipeline Company.

Since Arizona has no oil allowable restrictions and many areas of desirable oil and gas bearing lime, dolomite and sand as well as appropriate shale and calcareous source beds, oil hunters are looking our way.

1963 - Oil and Gas Compact Bulletin, v. 22, no. 1, June 1963, p. 19-20. By N.A. Ludewick, Executive Secretary, Oil and Gas Conservation Commission

Since our last report, November 30, 1962, 15 drilling permits have been issued which resulted in 12 exploratory wells being drilled, one of which, Texaco, Inc., Navajo "AG" in Apache County, resulted in a significant oil discovery, producing from the Devonian formation at a rate of 200 barrels per day. Four wells are now drilling and two wells are in the process of completion. Five dry holes were recorded.

During the year 1962, production in this state totaled 45,254 barrels of oil, 71,500 Mcf of natural gas and 369 MMcf of helium-bearing gases.

The connecting of oil and gas wells by pipe line during the year tended to stabilize a marketing situation which had existed since initial production.

Interest continues to be manifested in helium production and reserves as the helium content of gases from wells in Apache County are recognized as the highest discovered, within the United State, to date. The plant of Kerr-McGee oil Industries, Inc., at Navajo, Arizona, is consistently processing in excess of one million cubic feet of these gases each day. The pure helium extracted is delivered into trucks at the plant site.

The opening of the Kaibab (North) National Forest to oil and gas leasing promises to be a decided stimulus to the oil industry in Arizona.

1963 - Oil and Gas Compact Bulletin, v. 22, no. 2, December 1963, p. 71. By Lynn Lockhart, Vice-Chairman, Oil and Gas Conservation Commission, Official Representative, IOCC

Twenty-seven drilling permits have been issued since the last report of June 1, 1963. This is an increase of 80% over the 15 permits issued during the December, 1962 – May 1963, period and reported at midyear.

Basement tests are being drilled in the southeast, southwest, and over the northern half of the state. Seventeen wells are presently being drilled and tested.

Several mining companies drilling for potash in the Holbrook salt basin in the helium area could possibly discover an oil or gas field at any turn of the bit.

In addition to an early 1963 Devonian oil discovery with which Texaco, Inc., opened the Walker Creek Oil Field, Pan American Petroleum completed a gas condensate well, thus opening another field in the northeastern part of the state.

Eastern Petroleum Company and Kerr-McGee Oil Industries, Inc., completed more helium wells and the former company, majority interest owner, has requested that Navajo Springs fieldwide unitization be approved in order for a new helium plant to be built to separate the helium to be produced from the presently six shut-in helium wells comprising the proposed unit. This is 8% helium gas, same as nearby Pint Dome helium gas.

The Navajo Helium Plant, owned and operated by Kerr-McGee Oil Industries, Inc., and being the only privately owned helium extraction plant in the United States, is processing over one million cubic feet of raw gas per day. Thus, it is separating about 80,000 cubic feet of pure helium daily. Several plants process more gas per day, but none anywhere in the world have gas as rich in helium content (8%). Kerr-McGee also is preparing facilities to produce and sell liquid helium at this plant.

Helium has been found in wells near Holbrook, thus extending the area of helium possibilities westward fifty miles.

A $$250,\!000$ bonus offering for the first oil well produced off the Indian Reservation is now being processed.

With the recent successful lease sales in Navajoland and a few incentives for additional drilling, we look forward to a step-up of Arizona oil and gas activity.

1964 - Oil and Gas Compact Bulletin, v. 23, no. 1, June 1964, p. 24. By Lynn Lockhart, Vice-Chairman, Oil and Gas Conservation Commission, Official Representative, IOCC

Twenty-four drilling permits have been issued since December, 1963.

A test has been drilled in the Kaibab National Forest, and was completed as a dry hole in May; however this test did not reach target depth and was abandoned as 3862 feet. Oil companies are still keenly interested in the Kaibab area.

The \$250,000.00 bonus bill was introduced in the Senate, but failed to pass for political reasons. It is contemplated that a similar bill will be introduced to the legislators at their next regular session.

Eastern Petroleum Company has been granted a fieldwide unit covering 7,520 acres in Apache County, Arizona. This unit will be known as the Navajo Springs Unit. Coconino Sands under this unit were unitized for the production of helium. It is contemplated that unit production will either be sold to Kerr-McGee or will be separated by a new helium plant now under consideration. Helium represents eight per cent of the net producible gas and this is comparable with the Pinta Dome Field.

The Kerr-McGee Navajo Helium Plant, the only privately owned helium extraction plant in the United States has put a helium liquefier on stream. In addition to producing approximately 80,000 cubic feet of helium per day, the plant is now capable of producing 26 gallons per hour of liquid helium.

The Hopi Indians plan to hold their first oil and gas lease sale this year. Target date for this sale is September. The Hopi Indian Reservation covers the heart of the fabled Black Mesa Basin and it is anticipated that this sale will be participated in heavily by the oil industry.

The Superior Oil Company secured a lese on a five acre fee tract on the Hopi Reservation. Superior had planned to drill a stratigraphic test; however the Hopi Indians refused to let the rig and equipment enter the Reservation on the grounds that the heavy equipment would break down the roads. Superior has filed suit in Federal Court for denying them access to their lease. The Indians do not desire a test of the Black Mesa Basin until after their contemplated sale in September.

Monthly production of oil in Arizona is now approximately 5,000 barrels, helium approximately 48,000 MCF and natural gas about 85,000 MCF.

1964 - Oil and Gas Compact Bulletin, v. 23, no. 2, December 1964, p. 31. By Lynn Lockhart, Chairman, Oil and Gas Conservation Commission, Official Representative, IOCC

Twenty permits have been issued during the period June 10, 1964, through December 1, 1964.

Eastern Petroleum Company anticipates that the first Unit helium production from the Navajo Springs Unit, Apache County, Arizona, will begin in December, 1964. This production will go to Kerr-McGee's Pinta Dome plant.

As previously reported, an additional plant is being considered for this area. The initial contract between Kerr-McGee and Eastern is for a period of one year and a maximum of 12,500 mcf per month is involved.

The Hopi Indians have had two lease sales, bringing a total bonus of approximately \$2,000,000 to the Tribe. The lands leased have largely been in the Black Mesa Basins area of Navajo County, Arizona. About 50% of the offered lands have been leased.

Monthly production is now approximately 5,000 barrels of oil, 100,000 mcf gas, 45,000 mcf helium.

1965 - Oil and Gas Compact Bulletin, v. 24, no. 1, June 1965, p. 45. By Lynn Lockhart, Chairman, Oil and Gas Conservation Commission, Official Representative, IOCC

Since December 1, 1964, and through June 15, 1965, fifteen permits have been issued for exploratory wells within the State of Arizona.

The Hopi Indians conducted their first oil and gas lease sales between September and November, 1964, and these sales resulted in bonus bids of some three million dollars.

Four companies have drilled in the area. The wells drilled by Skelly Oil Company, Amerada Petroleum Corporation, and Texaco Inc. resulted in dry holes. The Atlantic Refining Company is currently drilling in S9-T28N-R15E, Navajo County. These four companies have apparently agreed to exchange information resulting from their exploration, and it is anticipated that each of these companies will drill additional wells within the 1965 calendar year.

The Ferrin #1 State well is currently drilling some twelve miles northeast of Winslow, Arizona. The operator has reported a show of helium and three potential oil zones. The helium lies at approximately 600 feet from the surface and the oil zones lie between 1,500 feet and 1,416 feet. These reported shows have not as yet been confirmed.

Approximately twelve miles southwest of Flagstaff, the Willett #1 State well has just spudded in. The operator plans to make a 5,000-foot test and contemplates possible helium in the Coconino formation at 600 +/- feet and tests of the Mississippian and Devonian formations.

A large lese play has recently been made in Pinal County, fifteen miles east of Eloy, wherein 60,000 acres of Federal and 45,000 acres of State leases were executed. A well designated as the Ari-Mass #1 State has been spudded on this block with indications that additional tests will be made.

The Snowflake-Holbrook-Winslow area is receiving its usual mount of attention and it is anticipated there will be drilling in this area in the future.

In the Pinta Dome-Navajo Springs area a new lease block, comprising some 30,000 acres, has been put together and exploration should start on this block within the next two months. The operator has announced intensions of drilling some ten exploratory wells here.

North of the Grand Canyon in Mohave County interest has picked up due to the current Nevada play.

The Cedar Wash area, located on the Nevada-Arizona border, approximately forty miles south of the Utah-Arizona border, is receiving considerable leasing activity.

To date no new production has been established within the State since our last report.

The current Legislature has greatly broadened the definition of "well" as contained in our statutes. This broadened definition will be under control of the Commission many wells extensively drilled for mineral exploration purposes but penetrating known or potentially producing oil, gas, and helium formations. The Attorney General is studying this new definition and will instruct the Commission in its use in the near future.

In the month of September, the Commission will hold a hearing on its Rules and Regulations, with the intention of updating them.

1965 - Oil and Gas Compact Bulletin, v. 24, no. 2, December 1965, p. 38-39. By Lynn Lockhart, Chairman, Oil and Gas Conservation Commission, Official Representative, IOCC

Since the last report to the Interstate Oil Compact Commission, 17 new wells have been drilled within Arizona. Of these 17 wells, nine have been drilled by Arkla Exploration Company. These nine wells, while primarily potash tests, also were looking for oil, gas, and helium. Two wells drilled by Apache Drilling Company resulted in new helium discoveries.

The first five wells drilled on the Hopi Indian Reservation were dry, but indications are that the companies were sufficiently encouraged by the resulting information to begin a new series of tests.

O'Donnell and Ewing Drilling Company is currently drilling in the large Chino Valley area. This test is in the vicinity of reported oil shows from wells drilled in the early 1900's. Of course this test is being closely watched.

The recent Nevada discoveries have increased leasing activity in the northeastern part of Arizona, [?] but as yet no wells have been commenced in the area.

The large block of acreage assembled east of Eloy in Pinal County is currently being tested. As of this time the results of the well are still unknown. It is anticipated that the well will be completed prior to the end of the year.

Southwest of Flagstaff, the Willett #1 State has been drilling. This test has run into water problems and is not as yet completed. The operator anticipates completion this year.

The Oil and Gas Conservation Commission received its Rules and Regulations as a result of a public hearing held in September. The new set of regulations, together with our current statutes, have been distributed and copies are now available.

1966 - Oil and Gas Compact Bulletin, v. 25, no. 1, June 1966, p. 128-129. By Lynn Lockhart, Chairman, Oil and Gas Conservation Commission, Official Representative, IOCC

Since the report of December, 1965, Arizona has issued sixteen drilling permits. Of these sixteen permits, four have resulted in helium production; four were drilled as potash tests; the others resulted in dry holes.

Skelly Oil Company drilled an important test in Mohave County, north of the Canyon at a location approximately eleven miles southwest of Colorado City. This well reached a total depth of 4,105 feet and was abandoned as a dry hole

There has been no further drilling on the Indian Reservation. However, it is our understanding there will be further testing on the Hopi Indian Reservation this year.

The Willett well, southwest of Flagstaff, reached a total depth of 3,781 feet before operations were shutdown because of weather. In the interim Mr. James M. Potter, Flagstaff, has taken over the operations of this well and it is his intention to bring in Schlumberger to log the well and then test potential productive zones.

Tenneco Oil Company recently completed a lease play of some several thousand acres, closely following the Mogollon Rim in the southern portion of Navajo and Apache Counties. It is anticipated that this acreage will be tested in the very near future.

As a result of a pre-trial agreement between Kerr-McGee Corporation and Arizona State Land Department, it was agreed that the base price would be \$1.50 per MCF of raw gas at the wellhead for helium in Pinta Dome and Navajo Springs, subject to upward decision by court decree. Increased interest and activity in this area has resulted.

Eastern Petroleum Company, Carmi, Illinois, owner of production in both Pinta Dome and Navajo Springs, has indicated its intention of commencing a thirty-well program in early summer

We are happy to report that Mr. Lynn Lockhart is re-appointed to Oil and Gas Conservation Commission, State of Arizona and was unanimously re-elected as Chairman. In addition, Mr. Hiram S. Corbett was recently appointed to fill the unexpired term of the appointment held by Mr. R. Keith Walden.

1966 - Oil and Gas Compact Bulletin, v. 25, no. 2, December 1966, p. 57. By Lynn Lockhart, Chairman, Oil and Gas Conservation Commission, Official Representative, IOCC

Arizona has issued 20 permits since our report of June, 1966. Of the permits issued, 8 were permits primarily concerned with potash exploration. Of the remaining permits, 5 were for helium prospects and 7 were oil prospects.

Verbal judgment in the suit between Kerr-McGee Corporation and Arizona State Land Department was handed down setting the price of raw gas (helium) at the wellhead at \$1.76 per MCF for the purposes of royalty payments to the State of Arizona As of this date no written decision has been forthcoming.

As an immediate aftermath of this decision activity within the area has shown a general increase and there is currently underway an exploration program which will ultimately involve approximately 25 locations.

Tenneco Oil Company has increased its holdings along the Mogollon Rim up to 180,000 acres and currently has four tests scheduled within its area of interest. The initial test is now being drilled.

An interesting aspect of this acreage play was the acquisition of some 40,000 acres of the Fort Apache Indian Reservation. The test now being drilled is on a portion of the Fort Apache Indian Reservation acreage.

Outside of the increased activity in the general area of helium production in Navajo County, there is evidence of increased leasing activity in the central portion of Cochise County.

The Hopi Indians are holding their fourth lease sale, and in general, have offered the south central portion of the Reservation for lease. It is of course with a great interest that this sale will be watched, particularly in view of the fact that the previous tests drilled on the Reservation gave indications that this was a more desirable section for exploration.

El Paso Natural Gas Company has acquired some 60,000 acres in the general area of Parker, Arizona in the northwest section of Yuma County. This acquisition is an attempt to gain underground gas storage close to their California outlet. Drilling and testing of this area should commence within the next few months.

The Arizona Oil and Gas Conservation Commission prepared and distributed a geological structure map of northeastern Arizona. A limited supply of copies is still available to interested people.

1967 - Oil and Gas Compact Bulletin, v. 26, no. 1, June 1967, p. 74-75. By Lynn Lockhart, Chairman, Oil Conservation Commission, Official Representative, IOCC

Since January 1, 1967, this Commission has issued 42 permits for wells within the State. Of these permits, 9 have resulted in dry holes, 12 were strat tests, one was a replacement helium well in the Pinta Dome Field, and the remainder reflected drilling within the Dineh bi Keyah area, which is located in Township 35 and 36 North, Ranges 29 and 30 East, Apache County.

To date, all of these latter locations have not as yet been dilled. The current drilling has brought in six producing oil wells and one dry hole, which is located in the extreme southeast corner of the area.

During March, 1967, two of the above wells were on production and accounted for 59,000 barrels of 43.5° gravity oil. This oil currently is being trucked to Four Corners Pipe Line for delivery into California markets.

The interest stimulated in the State as the results of this discovery has of course been great and is resulting inn large increases in state and federal leasing off the Navajo Reservation. Insomuch as the new field is wholly on the Navajo Reservation, lease plays there are negligible

The Navajos are contemplating an oil and gas lease sale on May 25, 1967. However, only four sections of land within boundaries of the area are being offered.

The Commission has issued an order amending Rule 102 wherein greater flexibility in issuance of a permit is set forth, as well as a method whereby a permit once issued can be cancelled.

Also issued by the Commission was an order whereby 160-acre spacing was established for an area of approximately seventy-two sections in the Dineh bi Keyah area.

1967 - Oil and Gas Compact Bulletin, v. 26, no. 2, December 1967, p. 78. By Lynn Lockhart, Chairman, Oil and Gas Conservation Commission, Official Representative, IOCC

Since June 1967, the Arizona Oil and Gas Conservation Commission has issued 32 permits. Currently seven of these wells are drilling and two will be spudded in the immediate future. Currently seven of these wells are drilling and two will be spudded in the immediate future. Seven of these permits were drilled as strat tests and have been plugged; eight were dry holes and eight were producing oil wells.

Of the 26 total wells drilled in Dineh-bi-Keyah Field, only three wells have resulted in dry holes. One of these was a failure to recover a fish and the replacement well made a producer. Currently there are 13 wells producing oil and gas and which have made more than a million barrels since June. Further development is still under way in this field and there is much optimism about the outcome. The remaining wells in this field failed to find the igneous sill; however, these are now shut-in gas wells, capable of producing commercial quantities of helium.

Increased drilling activity, spurred by the Dineh-bi-Keyah discovery, is reflected not only on the Navajo Reservation, but also it has created interest in the central and eastern portions of the state.

Construction of a new helium plant directly west of the Kerr-McGee Corporation plant at Navajo has commenced. The plant building, cement slabs, and temporary housing for personnel have been completed and it is anticipated that plant components will be arriving some time during the month of December. Arizona Helium Corporation, builder of the plant, is attempting to meet its target date of January 1, 1968, to have this plant on stream. However, it is more likely this will be late in February before this can b accomplished.

Recent lease sales held by the Navajo Indian Tribe have been quite successful, particularly in the Arizona portion of the Reservation. The last sale, held in September, 1967, brought bids in excess of \$425,000 for the tracts offered in Arizona.

The Oil and Gas Conservation Commission is very optimistic of course as to our State's future and looks forward to an even better year for 1968 than in 1967.

1968 - Oil and Gas Compact Bulletin, v. 27, no. 1, June 1968, p. 34. By Lucien B. Owens, Chairman, Oil Conservation Commission, Associate Official Representative, IOCC

Since Arizona's report of December, 1967, this Commission has issued 18 drilling permits. These permits have resulted in two new oil producers in the Dineh-bi-Keyah Field and one new shut-in helium well in the same field. Seven of the permits, one a strat test, resulted in dry holes. Currently eight permits, one of these also being a strat test, are in various stages of drilling.

At the end of the calendar year 1967 Arizona had produced 2,924,267 bbls of oil, 1,521,546 mcf of natural gas, and 899,783 mcf of raw helium gas. Through April, 1968 Arizona has produced 1,337,666 bbls of oil, 402,104 mcf of natural gas, and 254,190 mcf of raw helium gas.

On May 15, 1968 the Commission amended its Rule 105.D to provide administrative approval of an unorthodox well location resulting from the reclassification of a well due to change of GOR or due to recompletion.

As of May 1, 1968 Kerr-McGee Corporation announced a reduction in its price of pure helium from \$28.00 to \$24.00 per mcf at Navajo, Arizona.

Air Reduction Corporation has on stream a new helium plant located in Teec Nos Pos, Arizona. This is in the extreme northeast corner of the state and is initially producing gas from Texaco Inc. No. 1 Navajo Z well, located NW/4SW/4 36-41N-30E, Apache County, Arizona.

Arizona Helium Corporation will shortly have its new helium plant at Navajo, Arizona on stream.

Exploration has been comparatively slow in the state this year due to bad weather conditions north of the Mogollon Rim. From all indications Arizona should, however, enjoy an extremely good exploration season from now until the end of the year.

It is interesting to note that Cochise County, in the southeastern part of the state, is also undergoing some exploration and indications are there will be more in this area.

1968 - Oil and Gas Compact Bulletin, v. 27, no. 2, December 1968, p. 60. By Lucien B. Owens, Chairman, Oil Conservation Commission, Official Representative, IOCC

Since Arizona's report in June, 1968, this Commission has issued 19 drilling permits. These permits have resulted in two new shut-in helium wells located about 1 1/2 miles east of the Navajo Springs Unit. Ten of the permits, one a strat test, resulted in dry holes. Currently five permits are in various stages of drilling. Two are wrestling with serious water problems. Through October, 1968, Arizona has produced 2,905,673 barrels of oil, an increase of 26% over the first ten months production for 1967. To date 1,081,808 mcf of natural gas has been produced. This represents a decline of 14% from the production of the first ten months of 1967. There has been an 8% increase in production in helium, that is, 821,803 mcf of raw helium gas has been produced during these ten months. The center of interest still focuses on the fields of the Defiance Uplift in the Four Corners area; but, now we are looking forward in 1968 to the time when the Navajo and Hopi tribes will conclude their negotiations and put up their joint acreage in the center of the Black Mesa Basin for leasing by the oil companies, and allow this heretofore undeveloped acreage to come into our exploratory picture.

On September 18, 1968, the Commission made an exception to Rule 105B allowing 160-acre spacing in a designated section for gas wells drilled from the surface to the bottom of a specific formation. (The Coconino Formation) The Commission reserved the right to require the development of such further information as it might deem best interest for the State of Arizona.

Two different oil and gas lease sales of Navajo Tribal lands have been held since June, 1968. Four hundred and nine different tracts containing in excess of 375,000 acres were offered for lease. Two hundred and fifteen tracts were sold containing 190,000 acres. The bonus to the Navajo Tribe was in excess of 1.25 million dollars. They also received in excess of \$225,000 for first year rental. The highest bid brought \$107.12 per acre. The lowest acceptable bid bonus was \$2.50 per acre.

Arizona Helium Corporation has completed their new plant and have the necessary storage tanks on location. It is their intent to produce direct into the storage tanks and load all trucks from the storage tanks. It is anticipated it will take approximately four hours to load a truck and the existence of these storage tanks will allow specific loading scheduling.

We regret to announce that Mr. Lynn Lockhart, past chairman of the Oil and Gas Conservation Commission, expired in July, 1968. While State Senator, Mr. Lockhart authored and introduced the laws establishing the Oil and Gas Conservation Commission of the State of Arizona. The citizens of the State of Arizona will benefit because of this man's devotion to duty.

1969 - Oil and Gas Compact Bulletin, v. 28, no. 1, June 1969, p. 33-34. By Ralph Bilby, Chairman, Oil and Gas Conservation Commission

Since Arizona's report in November of 1968 this Commission has issued 21 drilling permits. These permits have resulted in three new oil wells. Ten of the permits, three being strat tests, resulted in dry holes. Currently four wells are in various stages of drilling and four wells have been permitted that will be spudded in June. The four wells being drilled at the report time in November of 1968 resulted in three dry holes. One well is being carried in a temporarily

abandoned status at the present time. The operator will attempt completion of the well as a helium well producing from the Shinarump formation. From January 1 through April, 1969, Arizona has produced 870,720 barrels of oil. To date 445,467 mcf of natural gas has been produced which represents as increase of 11% over the same period of 1968. There has been a 13% increase on the production of helium over that produced during the first four months of 1968. 270,948 mcf of raw helium gas has been produced during the first four months of 969. Two oil wells have gone off production and been abandoned. There has been a net increase of four producing helium wells and no change in the number of producing gas wells.

On March 19, 1969, the Commission authorized the disposal of salt water into the Akah formation in the same well bore that oil is being produced from the Desert Creek formation. The same order allows administrative approval for salt water disposal into various zones of the Pennsylvanian formation in two townships in Apache County, Arizona, on application that bears supporting data. On May 21, 1969, the Commission made exception to their Order No. 21 (which allowed 160-acre spacing in designated townships) allowing an additional well be drilled to the lower Hermosa formation conditioned upon a testing program that would further determine and define reservoir characteristics and drainage radius of wells in the Dineh-bi-Keyah Field.

Two different oil and gas lese sales of Navajo Tribal lands were held in February, 1969. These sales were held one week apart. The first sale brought high bids of \$11.16 per acre. The average price per acre for the sale was \$4.78. The proceeds (bonus and first year rental) to the Navajos from the sale amounted to approximately \$413,000. The second sale brought a high bid of \$7.72 per acre with an average price per acre of \$3.42. The total proceeds to the Navajos from this sale was \$290,000. The two sales offered a total of 433,000 acres in 280 tracts. Only 135,000 acres in 91 tracts were taken.

Cochise County, Arizona, has recently sprung to life as never before. Leasing of both State and Federal lands has run in excess of 350,000 acres during a three-week period in March of this year. The general location of this lease play is the entire eastern side of the County from Mexico north to the Graham County line. This area encompasses everything east of the Chiricahua Mountains. Qualified geologists are said to have predicted Cochise County will become the most important oil and gas producing area in Arizona – that large sedimentary sections present in the area are favorable for commercial oil and gas accumulations.

The Governor appointed Frank E. Moore as a member of the Commission replacing Lucien B. Owens whose five-year term expired. Mr. Moore is a resident of Douglas, Arizona, Cochise County. We are happy to report that Governor Williams appointed the retiring Chairman, Lucien B. Owens, to fill the unexpired term of the late Senator Lynn Lockhart. Kenneth G. Bentson, Phoenix, was elected Vice-Chairman and Ralph W. Bilby, Tucson attorney, was elected Chairman of the Oil and Gas Conservation Commission for the 1969 calendar year...

1969 - Oil and Gas Compact Bulletin, v. 28, no. 2, December 1969, p. 68. By Ralph Bilby, Chairman, Oil Conservation Commission

Since Arizona's report in June of 1969 this Commission has issued 23 drilling permits. These permits have resulted in 5 new oil wells and 9 dry holes. Currently 9 wells are in various stages of drilling. The 4 wells being drilled at the report time in June of 1969 resulted in 4 dry holes. Four wells that had been permitted but not spudded at the report date, June 2, 1969,

resulted in 2 dry holes, one oil well and one permit expired without drilling. Four wells that were on Temporarily Abandoned status in June have since been plugged and abandoned. From January 1 through October 1, 1969, Arizona has produced 2,053,545 barrels of oil. To date 1,333,700 MCF of natural gas has been produced which represents an increase of 23% over the same period of 1968. 761,891 MCF of raw helium gas has been produced during the first 8 months of 1969.

On August 13, 1969, the commission authorized an exception to Rule 105A (spacing) for an unorthodox oil well location account of topographical features appertaining to the 80-acre dedication unit.

Three different oil and gas lease sales of Navajo Tribal lands were held since the last report. The highest bids at these sales were \$10.57 per acre. The majority of the lands offered have been in the northeastern part of the state but little being in the vicinity of the Dineh bi Keyah Field. The leasing activity in Cochise County has remained fairly constant and indicating a growing interest in the southeastern section of Arizona.

This Commission was recently ordered by Governor Jack Williams to assume jurisdiction over a salt mining operation in the vicinity of Phoenix, primarily to prevent pollution of underground fresh waters in the area. A large salt deposit estimated to average 6000 feet thick is being mined by injecting fresh water into the formation and ponding the returning brine for evaporation.

1970 - Oil and Gas Compact Bulletin, v. 29, no. 1, June 1970, p. 34. By Ralph Bilby, Chairman, Oil and Gas Conservation Commission Associate Official Representative, IOCC

This Commission has issued only 10 permits since our report of December 2, 1969. This drilling has resulted in 4 dry holes, 4 wells still currently drilling, 1 well for the purpose of producing salt from a salt formation, and 1 well was turned over to the land owner as a water well.

The latter part of April a large lease play was made across the southern part of the state ranging from the town of Yuma northeasterly into the Phoenix area then south and east past Tucson. In addition, Cochise County has seen a great deal of leasing activity. Gulf Oil Company is currently engaged in geochemical work; and, many seismographic teams will be active in the newly leased area by the end of May. The Commission feels that Arizona may look forward to an excellent year of exploration through the southern part of the state and particularly in Cochise County.

On April 7, 1970, the Legislature passed Senate Bill 186 which removed the limitations on the amount of state oil and gas leases an individual may hold. The immediate result was the large leasing play above described wherein somewhat in excess of 825,000 acres of state lands were immediately leased.

Currently, El Paso Natural Gas Company is investigating an area in the southwestern edge of Yavapai County for potential underground storage of natural gas. And, in the Holbrook area, Aritex Development Company is developing underground storage for propane gas, seeking to establish an area to contain approximately half a million barrels of the liquefied product. The problems of potential pollution to fresh-water aquifers west of Phoenix in the salt mining project there have been successfully regulated. Commercial production from this project will start soon.

1970 - Oil and Gas Compact Bulletin, v. 29, no. 2, December 1970, p. 71. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

With the exception of a large lease play across the southern part of the state, ranging from the city of Yuma to the Phoenix area and southeast beyond Tucson, and an additional play in Cochise County, activity has been slow in the state. (The above lease play was mentioned in our last report but has remained fairly active throughout the year.)

Only thirteen permits to drill have been issued since the last report. Of these thirteen permits, two have resulted in producing helium wells; two holes were lost during drilling due to collapsed pipe; one well had a good show of oil but is temporarily abandoned; one was a strat test seeking a salt formation suitable for storage of natural gas (this well was successful in its purpose); one well was drilled for mining salt; two are presently drilling; four wells were plugged and abandoned. A basement test is in the planning stage on a 9,000 acre block in Cochise County.

A recent sale of oil and gas leases was held by the Bureau of Indian Affairs in Window Rock, Arizona. Eight operators were successful bidders on sixteen tracts in Arizona comprising a total of 28,680 acres. The highest bid for an Arizona lease was \$13.30 per acre.

The Aritex Development Corporation that has been developing underground storage for LPG in the Holbrook area is currently engaged in enlarging the storage area after successful preliminary tests on the initial cavity.

The Commission has enlarged its staff and moved into larger quarters. Two geologists, Jack N. Conley and Edward A. Koester, were added to the staff November 1. Mrs. Roberts Smith has also joined the staff as Geological Secretary.

Rate of production for 1970: oil -5,165 barrels; gas -4,397 Mcf; raw helium -2,115 Mcf.

On October 1, 1970, Western Helium Corporation placed a helium plant located at Navajo, in operation. This plant was originally built by Arizona Helium Corporation in 1967 but had never actually been in operation. Western Helium now has secured through agreement with Eastern Petroleum Company an adequate supply of helium to insure continued operation of this plant.

1971 - Oil and Gas Compact Bulletin, v. 30, no. 1, June 1971, p. 23-24. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

There have been five drilling permits issued since the last report. Of these five, one well has been completed as a dry hole, three are currently drilling, and one has yet to be spudded.

Prospects appear favorable for at least two deep tests in the southeastern part of Cochise County in the near future. There are also indications that drilling will be more active within the state during the remainder of 1971 than was experienced during the year of 1970.

Suburban Gas Company is planning to develop an LPG storage project in Navajo County, Arizona. Tentative plans call for a storage area that will allow the storage of some five million

plus gallons of LPG products. The completion of this project is anticipated in time to start storing products before the end of this summer. A California firm is also starting preliminary studies to determine the feasibility of an LPG storage project in Maricopa County.

The salt mining project that has been developed west of Phoenix has reached the production stage and is successfully mining salt. The salt will be used primarily as stock salt and for water softeners.

The Arizona State Legislature has passed and the Governor has signed into law House Bill 147. This bill makes minor revisions in the Arizona Revised Statutes. These revisions will enable the Commission to make some minor but urgently needed changes in the rules and regulations governing various drilling and production operations.

1971 - Oil and Gas Compact Bulletin, v. 30, no. 2, December 1971, p. 71-72. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

Activity in Arizona has shown a slight increase as compared to 1970. As of this date there have been a total of 25 drilling permits issued. There are presently six rigs running in the state with two additional start-ups expected within the next few days. Guadalupe Exploration Corporation has a projected 7,000 foot test underway in the southeastern corner of Cochise County. This test is being closely watched by several major companies as well as independent operators.

There is a 4,000 foot test that is scheduled to start shortly in Section 23-T9S-R19E [sic], Yuma County and another scheduled test in Section 30-T9W-R2S [sic], Maricopa County. Cities Service has recently completed a successful wildcat as a gas discovery in Section 21-T40N-R29E, Apache County. A permit has been issued to Cities Service for the drilling of another test in Section 17-T40N-R29E.

Humble Oil and Refining Company has recently acquired approximately 1,100,000 acres of oil and gas leases within the state. They are presently conducting seismic work in several areas.

Suburban Gas Company has completed the drilling of two wells in the Holbrook area – these are to be used as storage reservoirs for liquefied petroleum gases.

Western Helium Corporation has purchased from Arizona Helium Corporation the helium extraction plant at Navajo, Arizona and are presently modifying the plant to operate more efficiently. Start-up of this plant is expected before years end.

Considerable interest is being shown in possible exploration for geothermal resources in Arizona. One company has been formed, and is being quartered in Phoenix. Their major interest is in acquiring and developing geothermal resources.

Jack Conley, Staff Geologist, has prepared an "Index of Samples" that are available for inspection. This Index is experiencing considerable demand. Ed Koester, Staff Geologist, has prepared a study called "Salt Domes in Arizona". This publication is almost ready for distribution. Jim Scurlock, Director, Geology Section, in cooperation with Dr. Wesley Pierce, Arizona Bureau of Mines, has prepared an accumulation of all available geologic, engineering and production data in al wells that have been drilled in Arizona. This booklet should be available for distribution about the first of the year. Mr. Scurlock is presently working on a new state well location maps.

Our Rules and Regulations have recently been revised. The revisions were approved at a public hearing of the Oil and Gas Conservation Commission on September 17, 1971. There were no drastic changes made in the rules, rather an updating or in some cases clarification or modification of existing rules.

Judging from the number of requests for various types of information that this office is receiving daily, the various oil companies are at long last indicating some interest in Arizona. This interest is very welcome and, we believe, deserved.

1972 - Oil and Gas Compact Bulletin, v. 31, no. 1, June 1972, p. 37. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

This Commission has issued nine drilling permits since the last report. This has resulted in the drilling of two helium wells, three dry holes, one well still drilling, and three wells not spudded as of this date.

Leasing within the state is still fairly active. There are rumors of various major companies that are quietly acquiring large blocks of acreage, primarily in the southwest corner, west central Arizona, and the Strip Country (northwest Arizona).

Humble Oil and Refining Company is still engaged in geophysical exploration. It is reliably reported that this company is spending some \$250,000 per month on these investigations. According to reports, Humble will start drilling one or more stratigraphic tests by this June.

Suburban Companies have completed their underground storage project for LP gas, east of Holbrook. This storage area has been in service since November, 1971.

Anticipating exploratory activities for geothermal resources within the state before the year's end, this Commission has caused a bill to be introduced in the current session of the State Legislature. The purpose of the bill is to establish the standards and procedures for the exploration for drilling and production of geothermal resources. If this bill is passed, it will also place the responsibility for supervising the activities with the Oil and Gas Conservation Commission. As of this date, the bill has passed the House and is presently in the Senate. Final passage is expected within the very near future.

One firm, headquartered in Phoenix, has been acquiring considerable acreage in the Phoenix area and, according to the firm's president, plans to drill a geothermal resource test well very shortly.

This office has prepared a Directory of Services that operators new to the state may find helpful. Practically all specialized oil well services have to be secured from out of state. This directory lists the various services that might be needed in drilling and equipping an oil, gas or geothermal well and the nearest available source of the particular service.

Oil, Gas and Helium Production in Arizona, 1971

<u>Oil (Bbls)</u> <u>Gas (Mcf)</u> <u>Helium (Mcf)</u> 1,236,430 1,191,582 754,091

1972 - Oil and Gas Compact Bulletin, v. 31, no. 2, December 1972, p. 61. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

The Commission has issued fifteen drilling permits since the last report. This has resulted in the drilling of four helium wells, seven dry holes, two wells temporarily abandoned, one well still drilling and one not spudded as of this date.

Humble Oil and Refining Company are drilling on their third stratigraphic test. They have drilled test holes in Sec. 2-T8S-R8e, Pinal County, Sec. 25-T3S-R11W, Yuma County, and are presently drilling a projected 10,000' test in Sec. 5-T16S-R5E, Pima County. An official of Humble Oil recently announced that his company would continue their search until such time as they had thoroughly evaluated their lease holdings within the state.

Eastern Petroleum Company has been fairly active in their search for additional helium to supply the Western Helium Corporation's extraction plant in the Navajo Springs area. As of now, the search has been less than satisfactory.

Gulf Oil Corporation and Phillips Petroleum have been actively leasing within the state. Perhaps, this indicates additional exploratory activity.

1973 - Oil and Gas Compact Bulletin, v. 32, no. 1, June 1973, p. 34-35. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

This Commission has issued ten drilling permits since the last report. This has resulted in two wells being drilled for helium, presently temporarily abandoned; one strat test; four LPG storage wells; two oil tests, now in the completion stage; and one well drilled for geothermal resources.

Exxon Corporation (formerly Humble Oil & Refining Company) has completed a 12,556' strat test in Sec. 5-T16W-R15E, Pima County. This well sets the depth record for Arizona. Exxon has announced that they were suspending their stratigraphic program in Arizona. Information, logs, samples and so forth obtained from the four strat tests drilled by Exxon in Arizona will be available to interested parties one year after the completion of each well. Information from the 10,179' test drilled in Sec. 2-T8S-R-8E, Pinal County, will be available August 11, 1973.

Kerr-McGee recently recompleted their Navajo No. 2, Sec. 32-T36N-R30E, in the Dineh Bi Keyah Field of Apache County. Prior to recompletion, this well was producing approximately 1,700 barrels of oil per month. Three months later this well produced in excess of 19,000 barrels of oil per month. Other remedial work is planned by this operator as soon as weather conditions permit.

On January 1, 1973, Kerr-McGee acquired Humble Oil & Refining Company's four producing wells and one water injection well in the Dineh Bi Keyah Field of Apache County.

The Arizona State Legislature recently enacted legislation placing the exploration for drilling and production of geothermal resources under the jurisdiction of the Oil and Gas Conservation Commission. Geothermal Kinetics Systems, Inc., has been issued a permit to drill

an exploratory test for a geothermal well in Sec. 1-T2S-R6E, Maricopa County. Drilling is presently in progress on this well. Geothermal Kinetics is drilling this well "tight". However, the news media has reported shows of steam and some of the television stations have shown films with some steam visible.

Standard Oil Company of California has recently taken oil and gas leases on 24,000 acres in Mohave County. Perhaps, their interest will lead to some exploratory drilling in that area.

1973 - Oil and Gas Compact Bulletin, v. 32, no. 2, December 1973, p. 55. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

This Commission has issued nine drilling permits since the last report. This has resulted in the drilling of five oil tests, one test for geothermal resources, one storage well for LPG, one re-entry and one oil test not yet spudded. Of the five drilled oil tests, four had shows of oil and gas. None of these wells have yet been plugged and abandoned.

The operator that drilled the geothermal resources test is evaluating information obtained from the drilling of the above referenced test as well as a prior geothermal test mentioned in our last report. Incidentally, the two geothermal resource tests that have been drilled in Arizona are the deepest known tests for geothermal resources in the world.

Kerr-McGee has worked over several of their wells in the Dineh-bi-Keyah Field, Apache County. The results have been very satisfactory. This operator has been issued a drilling permit to drill a development well in this field. Since the discovery of the Dineh-bi-Keyah Field in 1967, it has produced over 12.5 million barrels of oil.

California Liquid Gas Corporation is constructing an underground storage reservoir for LPG in Maricopa County. This project is located approximately 15 miles west of Phoenix. The thickness of the salt in this area is estimated to be as great as 7,000'. The initial reservoir will have a capacity of 22 million gallons. Fenix and Scission is the prime contractor on this project.

This Commission's Geological Department has been busily engaged in preparing various maps, publications and geological data that will be of interest to any operator that might be considering Arizona as a possible area for oil, gas, helium or geothermal resources exploration. A booklet, "Source of Information on Exploration for Energy Resources in the State of Arizona," is available for interested explorationists. This booklet lists the various publications, maps, geological and geophysical data that has been prepared by our Geological Department. It also lists the sources and the information available outside the Oil and Gas Commission.

All well information in the Commission's files have recently been microfilmed. A Reader Printer is available in the Commission Office for operators interested in gathering information from the Commission well files.

1974 - Oil and Gas Compact Bulletin, v. 33, no. 1, June 1974, p. 30. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

Kerr-McGee Corporation has drilled and completed their Navajo No. 17 located in the NE/SE Sec. 31T36N-R30E, Apache County. This was a development well in the Dineh-bi-

Keyah Field. The well, competed in the Lower Hermosa, is producing in the interval from 3885-4003 from open hole. The operator reported an initial potential of 246 barrels oil with five barrels water per day. GOR 339.

Nix Drilling Company is drilling a geothermal resource test well in the NW/SW Sec. 16-T5S-R24E, Graham County. This is a proposed 2000' test. The operators have set 76' of 12 1/2" conductor pipe. The well is adjacent to what is known as Indian Hot Springs. This was an old resort area first developed in 1903. The water in these springs at the surface has a temperature of 119°F.

Activity within the state, while never exactly booming, has been unusually slow following Exxon's pull out after their four stratigraphic tests in the southern portion of the state. There has been a flurry of leasing recently. This leasing has been in the western-central portion of Navajo County, southwest of Holbrook and the northern portion of Mohave County.

Judging from the number of inquiries received by this office for various types of information, considerable interest in the state may be developing.

The Oil and Gas Conservation Commission at the request of the Governor caused a bill to be introduced during the past session of the Legislature requesting a \$432,000 supplemental appropriation. These monies were to be used to conduct geological studies within special areas of the state. The Oil and Gas Commission caused a tax incentive measure to be introduced during the past Legislative Session. This bill, had it passed as originally written, would have repealed all ad valorem taxes, state taxes, production taxes, and so forth on all oil, gas and geothermal resource production and would have substituted a 5% severance tax. The bill, in addition to lowering the overall tax on production, would have waived all taxes on production on the discovery well on a lease until the operator had recovered 200% of the cost of drilling and completing a well, or for a maximum of three years. This bill passed the House but was killed in committee in the Senate. The first mentioned bill died aborning.

The State Land Department has completed studies that theoretically locate the known promising areas for geothermal exploration. These areas have been classified as Known Geothermal Resource Areas. It is our understanding that these areas will be offered for bid in the very near future.

1974 - Oil and Gas Compact Bulletin, v. 33, no. 2, December 1974, p. 86. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

The Oil and Gas Conservation Commission has issued a permit for a basement test to be drilled in the NE/NE Sec. 16-T22S-R31E, Cochise County. This test is scheduled to spud in February, 1975. The reason for this delayed spudding, according to the operator, is to secure a casing allotment for this well.

Geothermal Kinetics-Amax Corporation has completed the drilling of a geothermal test located in the SE/SW Sec. 8-T7S-R22E, Pinal County, T.D. of 8,024 feet. Testing and evaluating of this well continues. No information is being released at this time.

Northwestern Arizona, in what is locally known as the Strip Country, has been the scene of rather extensive leasing this year. At least one company is planning to do some seismic work on their leaseholds. Another group stated their intention to drill at least one well in the area in 1975.

The Holbrook Basin area in parts of Navajo and Apache County has had fairly heavy leasing in recent months. The prime lessor in this area has announced that they plan to drill at least six or seven tests in the area.

Another area experiencing a fairly good lease play is the Mormon Lake area, some 20 to 30 miles southeast of Flagstaff.

Several operators are studying the feasibility of establishing LPG storage reservoirs within the known salt sections of the state. California Liquified Gas Corporation started their second storage project in the SW/NW Sec. 2-T2N-R1W, Maricopa County. Their first reservoir located in the same quarter section has been in use for storage since July, 1974. Williams Energy was the first company to successfully create LPG underground storage within the state. This project has been in operation since November, 1971.

The Commission recently had a show cause hearing granted on its own motion. This was for the purpose of requesting Eastern Petroleum Company of Carmi. Illinois to plug 13 of their nonproducing helium wells in the Navajo Springs area of Apache County. The hearing resulted in an order being issued demanding the plugging of these wells within a 45-day period.

The Commission staff has available for circulation several maps and geological reports. This information has been favorably received by a good number of operators. A complete listing of the information is available by request.

The State Land Department has at long last received approval from the Attorney General to draw for state lands for geothermal leasing. It is expected that the first offering will be made early in 1975.

1975 - Oil and Gas Compact Bulletin, v. 34, no. 1, June 1975, p. 19-20. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

The Oil and Gas Conservation Commission caused a bill to be introduced in the current session of the state legislature. This bill, if passed would place a 5% severance tax on the gross production of oil, gas, helium and geothermal resources produced in the state. This 5% severance tax is in lieu of all other taxes on production including ad valorem, production, sales, or excise taxes presently imposed. This would amount to a tax reduction on production of approximately 4%. In addition to the above, the bill would suspend the severance tax on the first qualifying well on a new lease until the operator has received 200% of the cost of drilling and completing the well or for a period not to exceed three years. For gas wells or geothermal resource wells the tax exempt period would not begin until such a time as the wells were placed on commercial production.

The Commission's efforts were successful in killing a bill in the current legislative session that was aimed at reducing the deletion allowance on oil or gas.

Williams Energy Company plans to increase the size of their LPG storage reservoir west of Holbrook, Arizona. This will entail the drilling of several more wells. The present capacity of this storage system is in excess of 10 million gallons. California Gas Corporation's storage reservoir just west of Phoenix is rapidly approaching 10 million gallons and will ultimately be enlarged to 50 million gallons.

By midsummer we expect some activity in the Holbrook Basin of Navajo and Apache Counties. Two companies have been drilling a series of strat tests in Apache and Navajo

Counties. Since the first of the year a total of 10 tests have been drilled, one is currently being drilled and two more have been permitted.

1975 - Oil and Gas Compact Bulletin, v. 34, no. 2, December 1975, p. 54. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

Activity within the state has been extremely slow this year. Several strat tests were drilled in Apache and Navajo Counties. These tests were searching fro potash and were under the jurisdiction of the Commission because they were drilled within the geological area of several helium fields.

Williams Energy has enlarged their LPG storage system in the Adamana area of Apache County by the drilling of three additional wells.

The anticipated exploration program that had been expected in the Holbrook Basin has failed to materialize. The Commission has, however, just issued a permit to drill a basement test in this area. Spud date is scheduled for December 23, 1975.

The Chinle School District No. 24, comprising the northern half of Apache County, has set their school district tax at slightly over \$45 per \$100 of valuation. This makes a total tax rate for this district of \$51 plus for each \$100 of valuation.

All of Arizona's oil and gas production is in this area. Since this excessive tax rate is confiscatory, this Commission is making every effort to have the tax laws revised to prevent a reoccurrence of this situation. The tax payers in this district have filed suits in both federal and county courts seeking relief from this monstrous tax bite.

1976 - Oil and Gas Compact Bulletin, v. 35, no. 1, June 1976, p. 17-18. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

Webb Resources, Inc., a Denver based Independent, is drilling the seventh well of a seven-well program in what is known as the Holbrook basin of northeastern Arizona. The first six wells drilled by Webb have been plugged and abandoned. Webb has released information on the first four wells. It can be reported that each well had a slight show of gas, however nothing of a commercial nature. All of the Webb wells have been basement tests.

Webb's play covers about one million acres across the basin. Some 750 fee acres are covered under an agreement with New Mexico-Arizona Land Company. The land company will receive a 40 percent working interest in any producing well after payout. Webb has taken an additional 300,000 acres of state and federal lands to fill out the acreage block. This program has been funded in part by a \$700,000 advance from Southern Union Gas Company. Any gas found will be dedicated to Southern Union's customers in Arizona. The Arizona Corporation Commission has allowed Southern Union to treat the advance as an expense to be amortized and recovered in future rate case proceedings. Thus, the company is under no obligation to make customer refunds if gas sufficient to recover the advance is not discovered.

Wichita Industries out of Wichita Falls, Texas, has been issued a permit to drill a 4,000 foot test approximately 12 miles south of Flagstaff. This will be the first of a proposed three-well program in this area.

Energy Reserves Group (formerly Clinton Oil Company) have been issued a permit to drill a development well on their Navajo "O" lease in Sec. 23-T41N-R30E, Apache County.

Our last report mentioned the \$45 per \$100 valuation that had been levied by Chinle School District No. 24 on the taxpayers of northern Apache County. After various legal suits and maneuvers, this controversy has been settled. The taxpayers agreed to an \$8 per \$100 valuation rate for the next two years.

Recent cuts in the appropriation to this Commission for the 1976-77 fiscal year have forced reducing the staff by three members – two geologists and one secretary will be terminated on June 30, 1976. While the positions have not been abolished, they were not funded for the upcoming fiscal year.

1976 - Oil and Gas Compact Bulletin, v. 35, no. 2, December 1976, p. 28. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

Webb Resources, Inc., a Denver based independent, has completed its seven-well program in the Holbrook basin of northeastern Arizona. All seven wells were basement tests and all have been plugged and abandoned.

Southern Union Gas Company contributed to this drilling program and according to rumors Southern Union hasn't completely lost interest in the area. It has also been reported that an active Rocky Mountain area operator is picking up leases in the area.

Wichita Industries, Wichita Falls, Texas, was issued five permits to drill Devonian tests in the Lake Mary area of north central Arizona. (This area is south and east of Flagstaff.) The operators drilled two of the tests and encountered fresh water in the Devonian in both wells. The three other proposed tests have been abandoned.

Energy Reserves Group (formerly Clinton Oil Company) requested a hearing by the Commission to drill an unorthodox location in the SW/SE/4 Sec. 23-T41N-R30E, Apache County. This well is projected to the Lower Ismay section of the Pennsylvanian formation. It is a direct offset of a producing well.

The hearing was held at the Commission offices in Phoenix on November 12, 1976. The proposed location was approved as requested.

Williams Energy Company has drilled three additional holes to be used for LPG storage at their storage project approximately 18 miles east of Holbrook, Arizona. When the leaching of these wells is completed, they will have a total of ten storage wells.

California Liquid Gas is also enlarging the LPG storage project that is located 12 miles west of Phoenix. With the completion of the well, Cal-Gas will have three storage reservoirs. The salt section at the Cal-Gas locations is several thousand feet thick, whereas at the Williams project the salt section is relatively thin.

1977 - Oil and Gas Compact Bulletin, v. 36, no. 1, June 1977, p. 21-22. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

Activity in Arizona, while never exactly brisk, has been unusually slow the past six months.

Leasing in Mohave and Cochise Counties has been on the upswing – both Mobil and Gulf Oil Companies have taken leases in Mohave County and it is reported that Mobil Oil Company is doing seismograph work on their leases.

Exploration for uranium is very active in parts of Maricopa, Yavapai, Mohave and Yuma Counties. Several operators are coring below 3,000 feet. Reports of uranium deposits in commercial quantities are very favorable.

Energy Reserves Group, Inc., Wichita, Kansas, requested a hearing to dispose of salt water in a temporarily abandoned hole drilled by Clinton Oil Company, now Energy Reserves Group. This well was drilled in 1972 in the NW of the SE 1/4 of Sec. 23-T41N-R30E, Apache County.

The hearing was held in the Commission offices on March 25, 1977. Permission was granted Energy Reserves Group to dispose of produced water in the Lower Ismay zone of the Pennsylvanian formation.

Two drilling permits have been issued to Pyramid Oil Company of Santa Fe Springs, California to drill test wells in the NE/SW/4 of Sec. 18-T40N-R9W and the NE/SE/4 of Sec. 28-T41N-R9W. Both wells are in Mohave County of northwestern Arizona. These wells will test the Devonian formation. One well is presently drilling.

A drilling permit has been issued to Energy Reserves Group for a development well in the Teec Nos Pos Field. The well is located in the NE/NE/4 of Sec. 26-T41N-R30E, Apache County.

The Commission has recently moved its offices from 8686 North Central Avenue, Suite 106, to 1645 West Jefferson, Suite 420, 85007. The telephone number, 271-5161, remains the same

The past session of the legislature passed a bill enabling the State Land Commissioner to lease state land for geothermal exploration. Prior to issuing a lease for geothermal exploration, the lease will be offered for public bid. The highest and best bid will be awarded the lease. Lease rentals will be \$1.00 per acre and royalty 12 1/2 percent.

The geological section of the Commission has just published two structure maps of the Eastern Mogollon Slope region embracing portions of Apache, Coconino, Gila and Navajo Counties. One map is contoured on top of Basement; the other contour horizon is the base of the Ft. Apache member of the Permian Supai formation. Both maps are drawn on a scale of 1:500,000. These maps are available, together with well-data tabulations, from the Oil and Gas Conservation Commission.

1977 - Oil and Gas Compact Bulletin, v. 37, no. 1, June 1978, p. 19. By John Bannister, Executive Secretary, Oil and Gas Conservation Commission, Official Representative, IOCC

It could be that Arizona's time to really enter the realm of oil producing states is nearer. If leasing activity is any criterion, the time is near. Anschutz Corporation has acquired some five million plus acres of oil and gas leases in 11 of Arizona's 14 counties. Other companies, both majors and independents, are leasing. With the vast amount of acreage under lease, it would seem only logical that there will be considerable exploration activity within the state in the near future.

Pyramid Oil Company, Santa Fe Springs, California, has drilled two wells in the north central portion of Mohave County. One of these wells has been plugged and abandoned. Operations on the second hole were suspended during the winter months. Several shows of oil and gas were reported from about 2,260 feet to 3,100 feet. Pyramid reports that these zones will be tested. Casing has been set in this well to 3,830 feet.

Energy Reserves Group has added two producing wells to its leases in the Teec-Nos-Pos Field in Apache County. Two more wells drilled by this operator have been temporarily abandoned. A third has been plugged and abandoned.

Eastern Petroleum Company and Kerr-McGee Corporation have plugged all of their helium wells in the Navajo Springs area of Apache County. Kerr-McGee Corporation shut down its helium extraction plant in 1976.

Kerr-McGee Corporation, at a public hearing, was granted permission for closer well spacing in the Dineh-bi-Keyah Field in Apache County. This operator has been issued drilling permits for three additional wells in this field and plans are to drill a total of seven wells in the field. This field has produced 14.6 million barrels of oil since its discovery in 1967.

The Oil and Gas Conservation Commission, at a public hearing recently, adopted a rule outlining the methods and procedures for the development of underground storage of liquefied petroleum gases and other substances. Certain safety features were also specified in this rule.

Exploration for uranium is continuing at a fairly brisk rate in the western portion of the state.

1978 - Oil and Gas Compact Bulletin, v. 38, no. 1, June 1979, p. 24-25. By W.E. Allen, Acting Executive Secretary, Oil and Gas Conservation Commission

In spite of the unprecedented leasing play which started when Anschutz Corporation took out some four million plus acres of state oil and gas leases in the latter part of 1977, there has been no exploratory drilling. There has been considerable geophysical activity in the southeastern, southwestern and northwestern portions of the state. There is now a total of some eight million acres, including state, federal and fee acreage, under oil and gas leases in Arizona.

It is our opinion that Arizona can expect some exploratory drilling before the end of 1979.

Kerr-McGee Corporation drilled and completed seven development wells in the Dinehbi-Keyah Field of northeastern Apache County during the year. The December production for

these seven wells was 12,757 barrels of oil and 3,860 MCF gas. One well was on production only three days during this period.

Energy Reserves Group had planned to resume drilling an additional development well in the Teec Nos Pos Field, Apache County, however local impediments encountered caused the company to abandon plans for additional drilling at this time.

This report is supposed to be only for the calendar year 1978, however the writer is going to take this method to advise all of John Bannister's many friends in the IOCC of his resignation effective February 16, 1979. John will be greatly missed by this Commission and his influence in the formation of state policy as it affects the oil and gas industry will also be a loss to the industry.

1979 - Oil and Gas Compact Bulletin, v. 39, no. 1, June 1980, p. 31. By W.E. Allen, Executive Secretary, Oil and Gas Conservation Commission

Leasing activity continued at an accelerated pace throughout the year. Almost all of the state and federal lands within the hypothetical overthrust belt are now under lease. There was also a search for available fee lands by various landmen. Five to seven seismic crews have been operating continuously throughout the year.

Four drilling permits were issued in 1979. Two of these were drilled and were dry holes. The other two were allowed to expire by the operators.

Production for 1979 was 471,836 BBL of oil and 346,117 MCF of gas.

So far, indications are that 1980 will be one of the better years for exploration in Arizona, since five permits to drill have been issued to date and drilling operation are now in progress at two locations.

1980 - Oil and Gas Compact Bulletin, v. 40, no. 1, June 1981, p. 25. By W.E. Allen, Executive Secretary, Oil and Gas Conservation Commission

Leasing activity continued at a torrid pace throughout 1980. Of the some 10,000,000 acres of state-owned lands, 7,790,029 are under lease for oil and gas exploration. Legislation was passed this year that increased the yearly rentals from 25 cents per acre to \$1.00. This bill also provided for the formation of exploratory drilling units which will permit the combining of state, federal and fee lands to make up the proposed unit.

The Bureau of Land Management (BLM) issues oil, gas, mineral and geothermal leases on federal lands within the state. Of the 31,595,388 acres available for leasing under their jurisdiction, 2,308 leases have been issued covering 4,245,286 acres. The ration of leases versus acreage variance on lands leased and applications on file is due to the revision in 1980, whereas one lease can now include 10,240 acres where previously it was limited to 2,560 acres per lease.

Throughout the year there were from five to eight geophysical crews working in the state.

Twelve drilling permits were issued in 1980. Eleven of these were for oil and gas. One was for a thermal gradient test hole. Five wells have been drilled and abandoned, two are temporarily abandoned, and one is still drilling. Two permits have expired and two are pending.

Phillips Petroleum Company acquired a one-third interest in the acreage held by Anschutz Corporation and Texhoma Production Company. Phillips also took over the drilling

operations of a proposed 20,000-foot test being drilled in Sec. 2-T7S-R10E, Pinal County. At year's end this well was drilling below 17,000 feet.

Phillips staked a location in Sec. 14-T20S-R23E, Cochise County, for a second 20,000 test.

Early reports indicate that 1981 should enjoy more drilling activity than 1980.

State lands under lease for geothermal operations total 34,356 acres and BLM has issued 13 leases covering 21,541 acres. Exploration for geothermal resources was limited to only one thermal gradient test hole.

Oil production for 1980 was 405,943 barrels – a decrease of 15 percent compared to 1979. A total of 357.4 MCF gas was produced – this was a slight increase compared with gas produced in 1979.

We have been informed that Kerr-McGee Corporation plans to start injecting gas back into the formation at the Dineh-bi-Keyah field, Apache County, some time in 1981.

1981 - Oil and Gas Compact Bulletin, v. 41, no. 1, June 1982, p. 17-19. By A.K. Doss, Executive Director, Oil and Gas Conservation Commission

The State of Arizona has just concluded a very successful year for oil and gas related activities. However, there was one well that had the attention of many people locally and also on an industry-wide basis that ended up being a disappointment to all. That was the Phillips Petroleum #1 State near Tombstone. Unfortunately, it had to be junked and abandoned after reaching a total depth of 10,561 feet. In spite of that misfortune, the following table indicates a startling comparison between the years 1980 and 1981:

	<u>1980</u>	<u>1981</u>
Number of drilling permits issued	14	73
Total number of wells drilled, all kinds	8	51
Total footage drilled	32,775'	65,400'
Number of oil test dry holes	7	9
Number of oil producers	0	6

The total of 51 wells of all kinds drilled almost represented the full range of wells that the Oil and Gas Commission permits and regulates; i.e., oil and gas tests, geothermal resource wells, underground storage cavity wells and reentries. Those missing were underground injection wells and disposal wells.

The six new producers are all on the Navajo Indian Reservation. Five new development wells were drilled by Kerr-McGee Corporation in the Dineh-bi-Keyah field. They all potentialed in the 200 barrels of oil per day range on pump. The sixth well is a wildcat drilled by Kenai Oil and Gas and located in Section 7, Township 40 North, Range 29 East. This well potentialed for 56 BOPD on pump.

By far the largest number of wells drilled was in the geothermal gradient class, which accounted for approximately 7,600 feet of footage drilled.

This increase in activity and production will also be reflected in an increase in revenue to the state by direct increases in taxes and rentals and indirect increases by dollars into commercial

sales to local merchants, as indicated in the following table estimated annually for the next few calendar years:

Oil and Gas Revenues to Arizona

<u>Direct</u>	1. Ad valorem taxes (10 cents/dollar on the gross sales of oil and gas production	\$1,312,500
	2. Sales tax (2.5% of the gross sales Of oil and gas production	400,000
	3. Rentals to the state (state lands and ½ on federal lands)	16,000,000 \$17,712,500
<u>Indirect</u>	Commercial sales – rent, food, clothing, Fuel, trucking fees, trucking charges, Recreation, etc., conservatively estimated	\$ <u>600,000</u>
<u>Total</u>		\$18,312,500

Leasing activity slowed down somewhat during 1981, but was still fairly brisk. At the present time, the following amounts of acreage are under oil and gas lease:

	Acres
Federal	13,000,000
State	7,900,000
Private (conservative est.)	5,400,000
Total	26,300,000

This total is equal to the size of the State of Ohio.

The prognosis for 1982 indicates an even better year than 1981. Conceivably, footage drilled could exceed well over 100,000 feet. Phillips Petroleum has a six-well drilling program outlined and other major companies and large and small independents have also indicated 1982 drilling activity for Arizona, scattered from the northwest corner to the southeast corner of the state. Needless to say, we all wish them the best of luck.

1982 - Oil and Gas Compact Bulletin, v. 42, no. 1, June 1983, p. 13-14. By A.K. Doss, Executive Director, Oil and Gas Conservation Commission

Arizona just concluded another busy year for oil and gas exploration and related activities. Two of the wildcats were "near misses" and one other wildcat logged oil and gas shows that were good enough to result in a very expensive attempt to complete the hole as a producer. The following table indicates a comparison of activities for the last three years:

	<u>1980</u>	<u>1981</u>	<u>1982</u>
Number of drilling permits issued	14	73	48
Total number of wells drilled, all kinds	8	51	42
Total footage drilled	32,775	65,400	76,708
Number of oil test dry holes	7	9	16
Number of oil producers	0	6	1

As can be seen there were a few less wells drilled in 1982, but the amount of footage drilled was considerably more than in 1981. Lines 4 and 5 show that there were substantially more wildcats drilled in 1982 and more than double the number (7) drilled in 1980. The 100,000 feet of footage drilled predicted for 1982 was not reached and this was undoubtedly the result in the budget cutbacks in practically all of the oil companies, large and small. The ratio of production to dry holes should improve measurably for 1983 since Kerr-McGee plans to drill seven infill wells in the Dineh-bi-Keyah field and Mountain States plans additional drilling in the Teec Nos Pos field. The one producing well was drilled by Mountain State as their No. 12 Navajo-O, a step out in the Teec Nos Pos field.

Brooks Exploration drilled a 7,000-foot wildcat in the strip country about half way between Fredonia and Colorado City (Short Creek). They ran a drill stem test (DST) between 570 feet to 642 feet and recovered 70 feet of oil cut mud and 20 feet of free oil. The oil was analyzed as 29° gravity API. Tentatively the oil formation is identified as the Shnabkaib member of the Moenkopi formation. Follow-up drilling could result in a field discovery of the old Virgin field type just across the state line in Utah. The other "near miss" is the Gustin No. 1-24 Federal located one mile north of Chambers. This well had sweet gas and oil on the pits at approximately 1,358 feet (formation unidentified). The oil on the pits was a high gravity sweet crude. Operator has installed a small pumping unit and at last report was pumping all water. Follow-up drilling is planned around this well.

Fifteen geothermal gradient holes were drilled by Phillips Geothermal Division in the Agua Caliente and Alpine areas. These holes accounted for approximately 6,000 feet of drilling.

At the present time the following estimated amounts of acreage are under active oil and gas lease:

	Acres
Federal	10,500,000
State	2,500,000
Private	5,000,000

Therefore, despite the fact that Phillips Petroleum only extended 280,000 acres of state leases, the estimated revenues to the State of Arizona remain relatively high.

1982 - Western Oil Reporter, v. 40, no. 6, June 1983, p. 33.

Wildcat tests offer some encouragement. Wildcat drilling in Arizona was up during 1982 and although there were no new field discoveries, there was a measure of encouragement in several areas.

In addition, an extension to Teec Nos Pos Field completed by MSR Exploration Ltd. and new spacing orders for the field may result eventually in 12 to 15 more wells. MSR completed its second well in the field extension early this year for 2.5 MMcfgd and 120 bc/d.

Although both oil and gas production were down in Arizona last year, expected new development work in the Teec Nos Pos and Dineh-bi-Keyah Field areas in Apache County may result in improving production in the near future. Kerr-McGee Corp., the operator for Dineh bi Keyah Field, is expected to drill seven development wells this year.

During 1982, Brooks Exploration reported oil recovery from what was tentatively identified as the Shnabkaib member of the Moenkopi Formation (Triassic) in a test near the Utah state line in Mohave County. A drill stem test between 570 and 642 ft recovered 70 ft of oil-cut mud and 20 ft of free oil. There is speculation that follow-up drilling may result in a field similar to the older Virgin Field across the border in Utah.

To the south and east, Cecil Gustin was credited with a "near miss" in NW NW 24-21-27E, Apache County. Reports said sweet gas as well as oil on the pits indicated shows at about 1358 ft (formation unidentified). The operator installed a pump but the production was water. Further testing is expected in the area.

Fifty miles west of Phoenix, Tri Oil Co. drilled a 4536-ft wildcat and encountered "numerous shows of oil." Test, however, were negative. Additional drilling is expected this year.

The 43 wells drilled in Arizona during 1982 include 16 wildcat tests for oil, two development wells, and 25 geothermal wells. Six of the oil tests were stratigraphic holes drilled by Philips Petroleum in its ongoing exploratory work.

The Arizona Oil & Gas Conservation Commission points out that about 18 million acres of federal, state and private lands are now under lease, and it expects activity to increase this year.

Earlier this year, Dowling Petroleum evaluated a 5006-ft test in NW NW 34-10s-23w, Yuma County. Log indicated shows in many zones and the company was planning completion work in May. The test is near the Mexican border, within seven or eight miles of rumored discoveries in Mexico.

1983 - Oil and Gas Compact Bulletin, v. 43, no. 1, June 1984, p. 15. By A.K. Doss, Executive Director, Oil and Gas Conservation Commission

This Commission issued 12 permits to drill. Eight wells were drilled with a total of 30,000 feet of footage. Of these eight wells, seven were dry holes and one was a producer. The producer was the Mountain States Resources #18 in the Teec Nos Pos field. The annual production for 1983 was 240,000 barrels of oil and 240 MMCF of gas.

1983 - By A.K. Doss, Executive Director, Arizona Oil and Gas Conservation Commission

Activity and Hi Lights. 1983 was a bad year for the oil and gas industry throughout the country. The slump which began in late 1982 stayed with us all through 1983. The March 1984 issue of Western Oil Reporter has an article depicting how depressed the activity has been in the Rocky Mountain States. Activity has declined as much as 37% in the region, and the prognosis for 1984 varies from one "expert" to another. The optimists predict 1984 will be a boom year for

exploration drilling since the drilling costs have dropped considerably below that of the last few years allowing a greater margin of profit for producing wells. Others predict that conditions will remain flat. The following table indicates the drop in statistics for Arizona for 1983. The high figures for 1981 and 1982 reflect the drilling of numerous shallow geothermal gradient holes. No thermal gradient holes were drilled in 1983.

	<u> 1980</u>	<u> 1981</u>	<u> 1982</u>	<u>1983</u>
Number of drilling permits issued	14	73	48	12
Total number of wells drilled, all kinds	8	51	42	8
Number of oil test dry holes	7	9	16	7
Number of oil producers	0	6	1	1
Total footage drilled	32,775'	65,400'	76,708'	28,875'

Two wells drilled in 1983 hold promise for potential production off the Navajo Indian Reservation. The Dowling Petroleum 1-A State, 9 miles south of Yuma, has casing set at approximately 5,002'. No completion attempts have been made at present, but the well has promise of being a gas/gas condensate producer. The other possible producer was drilled 8 miles north of Show Low by Resource Operating, Inc., and logged promising gas shows in the Tapeats Sandstone (Cambrian). Completion attempt was not made due to lack of a pipeline connection and the glut in the natural gas market.

Predictions for 1984 are difficult to make. Quite a number of oil operators have indicated that they have 1984 plans for drilling in Arizona, but I suspect the economic picture will have to greatly improve for their plans to become an actuality. In addition to the two potential gas wells, there is to be a rejuvenation attempt by Cam-Roy Research and Development Corporation of the two deep geothermal wells drilled near Higley, Arizona on the Power Ranch by Geothermal Kinetics Services approximately 10 years ago. Cam-Roy plans to move a rig on the location as soon as possible. If production tests are favorable, more drilling and a large development project is envisioned.

We still have a lot to look forward to in 1984.

1983 - By Rudy A. Ybarra, Enforcement Director, Oil and Gas Conservation Commission

Wildcat and developmental drilling in Arizona was down in 1983, a bad year for the oil and gas industry in the Rocky Mountain State region and the country as a whole. Oil production in the State was 239,613 barrels in 1983, a 28.5% decrease from the 335,208 barrels produced in 1982. The gas production decreased 11.9% from 261,200 Mcf in 1982 to 239,946 Mcf in 1983. The cumulative production through the year was 18,686,349 barrels of oil and 17,928,043 Mcf of gas.

Mountain States Resources, Inc., drilled two wells in the Teec Nos Pos Field during the year; No. 16 Navajo-O in January, and No. 18 Navajo-O at year's end. Well No. 16 was completed in a new fault block as a condensate/gas producer in the Desert Creek and Lower Ismay and shut in pending market outlet for the gas. Well No. 18 was being tested late in the year as a potential Desert Creek and Lower Ismay oil producer, also in the new fault block.

During 1983, Brooks Exploration, Inc., drilled the first of two planned follow-up wells to the wildcat well drilled in 1982 which had good oil recovery from a drill stem test between 570' and 642'. The well, No. 1-27 Federal in Sec. 27-40N-6W, was drilled to 2,500' and both the

shallow interval and the deeper dolomite section were evaluated without success. The well was plugged and abandoned as a dry hole. The second well is scheduled to be drilled sometime in 1984.

High Plains Petroleum Corporation drilled Well No. 1-13 Santa Fe RR in Sec. 13-21N-27E, some 800' from the "near miss" well drilled in 1982 by operator Cecil Gustin. The equivalent interval, 1,335'-1,389', that showed promise in the Gustin well did not yield any fluid when tested. Of interest, however, was a show of helium gas in the top 50' of the Coconino Sandstone. The well was plugged and abandoned as a dry hole.

Two wells were drilled in the southern Holbrook Basin, one by Resource Operating, Inc., in Sec. 29-11N-22E and the other by Sumatra Energy in Sec. 17-12N-26E. The Resource Operating well was drilled to 4,155' and good gas shows were encountered at 4,200' (Tapeats Sandstone). No completion was attempted because of the unfavorable gas market situation. The Sumatra well was drilled to 4,143' and recorded dead oil shows in the Coconino Sandstone and good gas shows in the Naco Formation. The two wells were plugged and abandoned as dry holes.

Sanchez-O'Brien Oil and Gas Corporation drilled Well No. 1-4 Federal in Sec. 4-4N-12E to a total depth of 3.394' but only two insignificant shows were encountered. The well was plugged and abandoned as a dry hole.

Dowling Petroleum, Inc., drilled Well No. 1 State in Sec. 34-10S-23W, Yuma County, to 2,925' but lost the hole after sticking drill collars at 600'. This well was to be drilled to 4,000'. A second well (No. 1-A State) was drilled in the same section to 5,006'. Oil and gas shows were reported on the mud log and a 4-1/2" production string was cemented at 4,977'. The well remains untested. Operators Redbird Oil Company and Central Oil Company, Inc., have been issued permits to drill in this same general area.

There was no additional drilling in the Wittman area (west of Phoenix) where Tri Oil Company drilled and abandoned a wildcat well in 1982. (SB)

Production data: 239,613 barrels oil 240.0 MMcf Gas

Drilling data: Total of 9 wells drilled, 6 dry holes, 1 discovery* Total of 34,075 feet drilled

*Mountain State Resources, Teec Nos Pos Field, Navajo "O" 16, SE SE Sec. 22, T.41N, R.30E., Desert Creek and Lower Ismay, capable of producing 2.3 Mcf gas per day with 125 barrels of condensate per day. Well shut in due to lack of contract for gas.

1983 - Western Oil Reporter, v. 41, no. 6, June 1984, p. 45.

Production continues downward slide. Statistically, 1983 was a near record year for Arizona. Wildcat drilling and hydrocarbon production sank to the lowest levels the state has seen in four years.

Oil production decreased 29%, from 335,208 bbl in 1982 to 239,613 bbl last year, and gas production slipped 12%, from 261,200 Mcf in 1982 to 239,946 Mcf in 1983. Although all six wildcats completed last year were abandoned, the tests attracted considerable industry interest and will provide valuable well control data for future exploratory efforts.

Large acreage acquisitions and geophysical studies begun in 1983 indicate long-term optimism about Arizona's production potential. Shell Western Exploration & Production Co. has an extensive geophysical survey underway in Mohave County on recently acquired acreage.

Basic Resources Corp., a New York-based international operator, also is conducting a large-scale Landsat survey in the Holbrook Basin.

Field development on Indian lands last year mirrored 1982 activity levels. Mountain States Resources Inc. drilled two wells in Apache County's Teec Nos Pos Field. The 16 Navajo-O was completed in a new fault block as a Desert Creek/Lower Ismay gas/condensate producer, but was shut-in pending market outlet. In April, the company was production testing its 18 Navajo-O as a potential Desert Creek/Lower Ismay producer also in the new fault block.

Kerr-McGee Corp. is negotiating a unitization agreement with the Navajo tribe and plans a secondary recovery program in Dineh bi Keyah Field when terms are finalized.

In the northeastern Arizona strip country lat year, Brooks Exploration Inc. drilled the first of two scheduled follow-up tests to a 1982 wildcat that recovered good oil shows on a drillstem test between 570 and 642 ft. The 2500-ft 1-27 Federal, in 27-40n-6w of Apache County, was plugged and abandoned after the shallow interval and deeper dolomite section were unsuccessfully tested.

High Plains Petroleum Corp. plugged and abandoned its 1-13 Santa Fe RR in 13-21n-27e of Apache County, a wildcat keyed off Cecil Gustin's reported "near miss" in 1982. Tests of the promising interval in Gustin's well, 1,335-89 ft, did not yield fluid, but a helium gas show in shallow Coconino Sand was recovered.

Natural gas shows in two Holbrook Basin wildcats may stimulate further activity. An unfavorable gas market prompted Resource Operating Inc. to abandon its 2 Federal in 29-11n-22e of Navajo County, although good gas shows were encountered at 4020 ft in Tapeats Sand.

Sumatra Energy Co. In. plugged and abandoned its well in 17-12n-26e of Apache County, after tests recovered dead oil shows in Coconino and small gas shows in Naco.

After encountering two insignificant gas shows, Sanchez-O'Brien Oil & Gas Corp. also abandoned its 3393-ft 1-4 Federal in 4-4n-12e of Gila County.

A remote test down south in Yuma County attracted several independent operators to the area. Dowling Petroleum Corp. reported oil and gas mud log shows on its 5006-ft 1-A State, but the well remains untested.

1984 - Oil and Gas Compact Bulletin, v. 44, no. 1, June 1985, p. 20. By A.K. Doss, Executive Director, Oil and Gas Conservation Commission

The continued all-over slump in the petroleum industry hit Arizona much harder than expected. Whereas we had expected a better year than 1983, just the opposite took place as indicated by the following statistics:

	<u> 1983</u>	<u> 1984</u>
No. of permits issued	12	6
No. of wells drilled	8	3
No. of dry holes	7	1
No. of producers	1	0
Temporary abandonment	0	2
Footage drilled	28,875	9,156

On the brighter side, there has been considerable leasing activity by a number of major oil companies in the northwest, north central and southeast part of the state. Along with these

lease plays, there has been an increased amount of seismic activity, but the prospects for drilling activity in 1985 remain very unpredictable.

1984 - By Rudy A. Ybarra, Enforcement Director, Oil and Gas Conservation Commission

Wildcat and developmental drilling in Arizona was down for the second straight year in 1984. Oil production in the state was 215,019 barrels in 1984, a 10% decrease from the 239,613 barrels produced in 1983. The gas production decreased 5% from 239,946 Mcf in 1983 to 226,848 Mcf in 1984. The cumulative production through 1984 was 18,903,506 barrels of oil and 18,206,641 Mcf of gas.

Central Oil Co., Inc., drilled two wildcat wells in the south Yuma area in Yuma county: No. 1 Aman in Sec. 5, T. 10 S., R. 23 W. and No. 1 MCP Blank in Sec. 32, T. 9 S., R. 23 W. The Blank well was plugged and abandoned after drilling to 2551'. The Aman well was drilled to 2,883' and 4-1/2" casing cemented at 2,830'. The lower intervals were being tested at year's end.

Shields Exploration Co. drilled well No. 2-19 Federal in Sec. 19, T. 41 N., R. 1 E. in Coconino county. The well was drilled to 3,756' and is bottomed in the Cambrian Muav. Testing will commence in early 1985.

Leasing activity throughout most of the state remains strong, especially in the northwest, southwest, and southeast corners.

If some of the plans we hear about ever fall into place, 1985 should be an exciting year for us.

1985 - Oil and Gas Compact Bulletin, v. 45, no. 1, June 1986, p. 17-18. By R.A. Ybarra, Enforcement Director, Oil and Gas Conservation Commission

Activity in the state in 1985 continued its slow pace over the poor showing in 1984. One carryover well from 1984 and two other wells for 1985 were completed during the year: one dry hole, one temporarily abandoned, and one producer. The first two wells were drilled in the Arizona strip area, one to a shallow Moenkopi target in Mohave County and the other a Mississippian test in Coconino County. The third completion was a semi-development well in the Dry Mesa Field, Apache County, by Monsanto Oil Company. This well, No. 6 Navajo-138, was completed August 1985, pumping 146 barrels of 40° API gravity oil, 21 MCF of gas, and 200 barrels of water per day through perforations of 5,256' and 5,272' to 5,285' in the Leadville Formation. The operator may drill an additional well or wells depending on the production behavior of this well.

The leasing activity remained strong during the year, with an added interest in the east-central part of the state where a lease play by Shell Oil Company and others in western New Mexico may extend by as many as 800,000 acres into Apache, Greenlee, and Graham counties in Arizona.

As cited before, one of three wells (Coconino County well) mentioned in this report was drilled in 1984 but was not competed until 1985 and placed on temporarily abandoned status, as shown in the following statistics:

	<u> 1984</u>	<u> 1985</u>
No. of permits issued	6	2
No. of wells drilled	3	2
No. of dry holes	1	1
No. of producers	0	1
Temporary abandonment	2	1
Footage drilled	9,156	6,120

Prospects for drilling activity in 1986 look less than optimistic, but early indications are that several will be drilled if oil prices don't continue to deteriorate.

1986 - By Rudy A. Ybarra, Enforcement Director, Oil and Gas Conservation Commission

Drilling activity in 1986 showed an improvement over the previous year. There were seven exploratory wells spudded during the year, four of which were completed as dry holes, one placed on temporary abandonment status, and two were drilling at the end of the year. There were no development wells drilled.

Four of the wells were drilled in the east central part of the state a few miles from the New Mexico line. The main drilling target in this area was the upper Paleozoic section (Pennsylvanian and Permian). Three of the wells encountered severe lost circulation zones at shallow depths and were plugged and the other well was drilling at year's end. Two wells were drilled in north central Arizona near the Utah line where the middle to upper Paleozoic section (Cambrian, Devonian, and Mississippian) was the drilling objective. One of these two wells was plugged because of stuck drill pipe and never reached its main target, the Cambrian Tapeats Sandstone. The other well in this area was nearing its proposed depth at year's end. The last of seven wells was drilled in the Basin and Range Province northwest of Tucson. This well was targeted for 1500' but was plugged after reaching basement at 168'.

	<u>1984</u>	<u>1985</u>	<u>1986</u>
No. of permits issued	6	2	6
No. of wells drilled	3	2	5
No. of dry holes	1	1	4
No. of producers	0	1	0
Temporary abandonment	2	1	1
Footage drilled	9,156	6,120	9,026

Oil production in the state was 160,212 barrels, an 8% decline from the 174,031 barrels produced in 1985 and the gas production also declined 11.7% to 185,200 MCF from the previous year.

There were no application for enhanced recovery projects, unitization, and NGPA certificates.

1987 – Interstate Oil & Gas Compact & Committee Bulletin, v. 2, no. 1, June 1988, p. 82. By Rudy A. Ybarra, Enforcement Director, Oil and Gas Conservation Commission

There were four wells completed in 1987, three of which were completed as dry holes. The fourth well was drilled to final T.D. in January 1987, and after drill stem testing three intervals the well was put on the pump. In December the pumping unit developed mechanical problems and the well was placed on temporary abandonment status. Fluid recovery was mostly fresh water and on occasion a skim of oil.

Two of the three dry holes were drilled by Petroleum Technical Service Co. in Yuma County in the southwestern part of the state. The first well, No. 4-1 Federal in Sec. 4-11S-24W, was drilled to 7,000 feet. Well No. 26-1 Federal in Sec. 26-11S-23W reached a total depth of 9,135 feet before it was plugged. No oil or gas shows were reported from either well

The third dry hole, well No. 1B State, was drilled by Combined Drilling Ventures, Inc. in Sec. 28-12N-28E in Apache County. This well encountered serious lost circulation problems and was plugged after reaching 3,296 feet. No shows of oil or gas were reported.

	<u> 1985</u>	<u> 1986</u>	<u> 1987</u>
No. of permits issued	2	6	2
No. of wells drilled	2	5	4
No. of dry holes	1	4	3
No. of producers	1	0	0
Temporary abandonment	1	1	1
Footage drilled	6,120	9,026	19,504

Annual oil production in the state was 130,726 barrels, a decline of about 18 percent from the 160,212 barrels produced in 1986, and the gas production remained about the same (185,000 MCF) as the previous year. The State's peak annual production rate was 3.363 million barrels in 1968 and 1.578 million MCF of gas in 1970.

There were no applications for enhanced recovery projects, unitization, and FERC certificates.

1988 – Interstate Oil & Gas Compact & Committee Bulletin, v. 3, no. 1, June 1989, p. 92-93. By Steven L. Rauzi, Oil & Gas Specialist, Oil and Gas Conservation Commission

Continued slow activity in Arizona reflects the dwindling domestic exploration expenditures of the late 1980's. In 1988, only one well was drilled for oil in Arizona. The Suncor No. 1-19 in Section 19-T2N-R1W was drilled to test objectives below the Luke salt deposit. Miocene sands were thought to underlie the base of the salt at about 3,155 feet. As it turned out, the well was still drilling salt at 4,000 feet at which point the well was abandoned and converted to water well use. Since the base of the salt was not penetrated, the well did not test the primary objective.

	<u>1986</u>	<u>1987</u>	<u>1988</u>
No. of permits issued	6	2	1
No. of wells drilled	5	4	1
No. of dry holes	4	3	1
No. of producers	0	0	0
Temporary abandonment	1	1	
Footage drilled	9,026	19,504	4,000

Annual oil production in Arizona declined about 13 percent to 113,179 barrels. Annual gas production declined about 4 percent to 178,596 MCF.

No applications were received for enhanced recovery projects, unitization, or NGPA certificates.

1989 – Interstate Oil & Gas Compact & Committee Bulletin, v. 4, no. 1, June 1990, p. 100. By Steven L. Rauzi, Oil & Gas Specialist, Oil and Gas Conservation Commission

Drilling and Production: Oil and gas-related activity in Arizona was up slightly in 1989 and one new drilling permit was issued late in the year. The drilling activity included one stratigraphic test, a replacement well, and several workovers and recompletions. The stratigraphic test was drilled under the one new drilling permit issued in 1989 and the replacement well was drilled under a permit first issued in late 1987. Drilling started on the replacement well in December, 1988 and the well was completed in the first half of 1989. The several workovers and recompletions did not require new drilling permits.

Workover rigs were active in both the Black Rock gas field and the Dry Mesa oil field. The Black Rock gas field was initially drilled in the early 1970', but was not produced for lack of a pipeline right-of-way. Connection of Black Rock to the El Paso Natural Gas Company pipeline in 1989 resulted in both the workover activity and the first sales of gas from this field. In conjunction with the workover activity, the Oil and Gas Conservation Commission held two public hearings in 1989. In the first hearing, the Commission granted 160-acre spacing in the Black Rock field and in the second, the Commission approved an application to recomplete a well in the field to a water disposal well.

Due to the workovers and recompletions, both oil and gas production in Arizona realized a respectable increase in 1989. Oil production was up nearly 22 percent, from 113,179 barrels in 1988 to 137,970 barrels in 1989. Gas production was up an impressive 715 percent, from 178,596 MCF in 1988 to 1,455,517 MCF in 1989.

Refineries: There are now two oil refineries in Arizona. The second oil refinery was built between Phoenix and Tucson in the first half of 1989 and began processing crude in September. The source of crude oil for the new refinery is the All American pipeline which currently moves about 100,000 barrels of crude oil a day from California to Texas. The total 1989 refinery output in Arizona was approximately 463,000 barrels.

LPG Storage: Subsurface salt deposits in Arizona currently host two LPG storage facilities and a third facility is under consideration. The two active facilities utilize 14 wells and have a total storage capacity of nearly 219.1 million gallons. Throughput for 1989 was about 100

million gallons. At year end, near the peak of the winter delivery season, there remained close to 59 million gallons of butane and propane in underground storage.

1990 – Interstate Oil & Gas Compact & Committee Bulletin, v. 5, no. 1, June 1991, p. 83. By Steven L. Rauzi, Oil & Gas Specialist, Oil and Gas Conservation Commission

The Commission issued eight new permits to drill in Arizona in 1990. All of these permits were for development wells in the Black Rock gas field in northern Apache County. Two of the wells were completed as gas wells and a third was junked and abandoned at a shallow depth due to severe hole problems, the remainder of the permits were granted extensions. In addition to these development wells, one exploratory well in northern Coconino County was deepened into un-metamorphosed Precambrian sedimentary rocks in the latter half of the year. The deepening of this well did not require the issuance of a new drilling permit.

Along with their regularly scheduled meetings, the Oil & Gas Conservation Commission held two public hearings in 1990. In the first, the Commission approved an application to convert a depleted oil well in the Dry Mesa field into a produced-water disposal well. In the second, the Commission passed a motion to require the re-injection of all water produced in two geothermal wells.

Oil production in 1990 was 121,855 barrels, down from 137,970 barrels in 1989. Gas production was 2.1 billion cubic feet, up from 1.5 billion cubic feet in 1989.

Refinery output in 1990 was two million barrels, up from 463,000 barrels in 1989. Asphalt and diesel fuel currently make up the bulk of the refinery output. Throughput at the two underground LPG storage facilities in 1990 was about 75 million gallons, down from about 100 million gallons in 1989.

Some of the more interesting oil and gas leases taken in 1990 include an area around the old Phillips Tombstone well in Cochise County, an area over the Luke salt deposit in Maricopa County, and at several locations in northern Mohave and Coconino Counties. Some of the leases in northern Mohave and Coconino counties are in areas underlain by the recently recognized oil-prone source rocks of late Precambrian age.

1991 – Interstate Oil & Gas Compact & Committee Bulletin, v. 6, no. 1, June 1992, p. 66-67. By Steven L. Rauzi, Oil & Gas Program Administrator, Oil & Gas Conservation Commission

Activity Summary – 1991: In July 1991, administrative and staff support for the Arizona Oil and Gas Conservation Commission was transferred to the Arizona Geological Survey (AZGS) in Tucson. This action, which eliminated the office the Commission had maintained in Phoenix since 1959, was taken to reduce expenditure of General Revenue funds. The sixmember Commission retains the statutory powers and duties to hold hearings, issue orders, approve rules, and set policy. The Oil and Gas Program Administrator of the AZGS handles the day-to-day administrative and regulatory functions required in the permitting, drilling, production, and underground storage of oil, gas, helium, and geothermal resources.

The AZGS issued one permit to drill in Arizona in 1991. The permit was issued to United Gas Search of Tulsa, Oklahoma, for a 6,500-foot wildcat well in the northwestern part of

Mohave County, about 15 miles south of St. George, Utah. The well had not been spudded by years end, but the permit is valid until June 1992.

In addition to their regularly scheduled meetings, the Oil and Gas Conservation Commission held two petitioned public hearings in 1991. In the first hearing, the Commission approved an application to amend Dry Mesa Corporation's water-disposal permit to accept water produced from recently recompleted wells in the Paradox Formation in the Dry Mesa Field. In the second hearing, the Commission approved an application to amend Merrion Oil and Gas Corporation's water-disposal permit to accept water produced from the recently recompleted well in the Leadville Formation in the East Boundary Butte Field. Late in 1991, the Commission approved a five-year review of the oil, gas, and geothermal rules, which called for repealing three rules, adopting five new rules, and amending 54 rules. The proposed changes will result in a combined set of oil, gas, and geothermal rules.

Oil production in 1991 totaled 110,772 barrels from 22 producing wells, down from 121,855 barrels in 1990. Gas production totaled 1.3 billion cubic feet from six producing gas wells, down from 2.1 billion cubic feet in 1990. Fifteen wells were idle at the end of 1991, including two shut-in helium wells at the Dineh-bi-Keyah Field. One oil well completed in the Mississippian Formation in the Dry Mesa Field was recompleted as a gas well in the Paradox Formation.

Refinery output in 1991 was 2.5 million barrels, up from 2.0 million barrels in 1990. Asphalt, diesel fuel, and jet fuel made up the bulk of refinery products. Feedstock for the refinery at Coolidge comes from California via the all American Pipeline whereas most of the feedstock for the refinery at Fredonia is trucked in from fields in Nevada.

Throughput at the two underground LPG storage facilities in 1991 was about 55 million gallons in receipts and about 67 million gallons in deliveries. Total product in storage at year-end was about 24.3 million gallons. Stored products included propane; iso-, normal, and mixed butane; and propylene. The development of a natural-gas storage facility in subsurface salt in Mohave County is being planned.

There were no enhanced recovery projects, unitizations, or NGPA certificates for the year.

Exploration-Related Activities: State land under oil and gas lease at year-end 1991 was 70,084 acres. The most active areas of leasing are the northwestern and southwestern parts of the state. Leasing of state land is noncompetitive, requiring a \$100 application fee and a one year advance rental. State leases carry a five year term at \$1 per acre annual rental and can be extended for one additional five-year term at \$2 per acre annual rental.

The state royalty rate is 12.5 percent. Federal acreage under oil and gas lease at year-end was 201,981 acres. Two leases in northwestern Mohave County, Arizona, were picked up at the Bureau of Land Management's competitive lease sale in December 1991 and eight tracts were picked up noncompetitively after the sale.

The oil source rock potential of the Precambrian Chuar Group, exposed in northern Arizona, continues to attract interest among explorationists. Two abstracts on this subject appeared in the recent U.S.G.S. Eighth V.E. McKelvey Forum on Mineral and Energy resources held in February 1992. One abstract, *Petrography and Rock-Eval Studies of Organic Matter in Precambrian Rocks, U.S.A. and U.S.S.R.* by Mark Pawlewicz and James G. Palacas compared vitrinite-like particles from widely scattered Precambrian terrains. This study showed that the Kwagunt Formation of the Chuar Group is mature with respect to liquid hydrocarbon generation. In the second abstract, *The Lake Superior Oronto Group, a Middle Proterozoic Exploration*

Model for the Late Proterozoic Chuar Group of the Grand Canyon, by Albert B. Dickas and M.G. Mudrey, Jr., the exploration philosophy applied to the Oronto Group is presented as a model for Chuar Group hydrocarbon evaluation. A recent M.S. thesis from Northern Arizona University, Sedimentology and Shale Petrology of the Upper Proterozoic Walcott Member, Kwagunt Formation, Chuar Group, Grand Canyon, Arizona by David A. Cook, provides detailed information on the depositional environments of the hydrocarbon-rich Walcott Member of the Chuar Group. This study includes detailed section descriptions from Nankoweap Butte and Sixtymile Canyon and clay mineralogy data used to predict oil generation. On the same subject, the Arizona Oil and Gas Conservation Commission published Distribution of Proterozoic Hydrocarbon Source Rock in Northern Arizona and Southern Utah, which deals with the areal extent of the ancient Chuar basin and provides key well control bearing on the current preservation of Chuar Group rocks in pre-Paleozoic graben. This report includes a 1:500,000 scale map of the subcrop and structure of the Precambrian surface and is available from the Arizona Geological Survey.

1992 – Interstate Oil & Gas Compact & Committee Bulletin, v. 7, June 1993, p. 210. By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

The Oil and Gas Conservation Commission issued two permits to drill in 1992. The first was issued to Dry Mesa Corporation of Farmington, New Mexico, for a reentry of an abandoned well drilled by Pure Oil Company in the Dry Mesa Field in 1962. Pure Oil Company failed to establish oil production from the Mississippian rocks in this well but did recover gas in a drill stem test of the overlying Pennsylvanian rocks. Dry Mesa Corporation completed the well as a gas producer in the Pennsylvanian rocks on May 14. The second permit was issued to Arrowhead Oil and Gas Company of Denver, Colorado, for the SunCor-Melange #32-23 well near Litchfield Park, about 15 miles west of downtown Phoenix. The Arrowhead well was drilled to a total depth of 6,650 feet to test the potential of sand pinch outs in the Luke salt, which is a large mass of subsurface salt in the vicinity of Luke Air Force base. This hole was completed as a dry hole in late September.

Oil production in Arizona in 1992 totaled 94,426 barrels from 22 producing wells, down from 110,772 barrels in 1991. Gas production in 1992 totaled 794 million cubic feet from six producing wells, down from 1.3 billion cubic feet in 1991. Fifteen wells were idle at the end of 1992, including two shut-in helium wells at the Dineh-bi-Keyah Field in northeastern Apache County. Many of the idle wells at the Dineh-bi-Keyah Field are shut-in in anticipation of a future water-flood project.

Refineries produced 2.4 million barrels of product in 1992, down from 2.5 million barrels in 1991. Products consisted mostly of asphalt, diesel fuel, and jet fuel. The Sunbelt Refining Company near Coolidge processes heavy crude oil that comes from California and the North Slope of Alaska in the All American pipeline. The Intermountain Refining Company near Fredonia processes crude oil that is shipped in trucks from the Grant Canyon and Trap Springs fields in Nevada.

Products transferred through liquefied-petroleum-gas (LPG) storage-well facilities near Litchfield Park and Adamana in 1992 included about 66 million gallons in receipts and about 50 million gallons in deliveries. About 40 million gallons were in storage at the end of the year. Stored products included propane; iso-, normal, and mixed butane.

The Commission held three regular meetings in 1992. Also in 1992, the Commission amended its rules and merged the geothermal rules with the oil, gas, and helium rules. The amended rules will replace the existing rules as soon as they are certified by the Attorney General's Office.

Leasing increased slightly on State Trust land and decreased slightly on Federal lands during the year. State Trust land under lease as of December 1992 totaled 72,593 acres, up from 70,084 acres in December 1991. Federal land under lease as of December 1992 totaled 109,279 acres, down from 201,981 acres in December 1991. Most leasing took place in the northwestern part of the state.

There were no applications for enhanced recovery projects, unitization, or NGPA certificates for the year.

1993 – Interstate Oil & Gas Compact & Committee Bulletin, v. 8, June 1994, p. 275-276. By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

One new permit to drill was issued in 1993 for the Tonto Drilling Services 1 Alpine-Federal, a geothermal test of the hot-dry-rock potential of granite in the White Mountain volcanic region of eastern Arizona. The Alpine hole, funded by the Arizona Department of Commerce and the U.S. Department of Energy, was cored from 500 feet to total depth of 4,505 feet.

It did not reach granite but revealed bleeding oil shows in Permian carbonates, thus indicating hydrocarbon potential beneath the extensive surface cover of volcanic rocks in the region. The shows in the Alpine hole and the hydrocarbon potential of the region are the focus of at least two recent reports. In addition, a geochemical analysis of the core was prepared by Humble Geochemical Services of Humble, Texas.

Also in 1993, Chuska Energy Co. (now Harken Energy) drilled two development wells in the Black Rock gas field of northeast Arizona. One, Black Rock 12, was completed as a gas well and the other, Black Rock 10 was completed as a dry hole. The permits for these two wells were first issued in 1990 and renewed in the summer of 1993.

Oil production in Arizona in 1993 totaled 73,141 barrels from 20 producing wells, down from 94,177 barrels in 1992. Gas production in 1993 totaled 618 million cubic feet, mostly from six producing gas wells, down from 794 million cubic feet in 1992. Twenty three wells were idle at the end of 1993.

The two refineries in Arizona produced 1.1 million barrels of product in 1993, down from 2.4 million barrels in 1992. Production consisted mostly of asphalt, diesel fuel, and jet fuel.

The Sunbelt Refining Company near Coolidge shut down in August 1993. It processed crude oil from California and the North Slope of Alaska that was shipped in the All American pipeline.

The Intermountain Refining Company near Fredonia processes crude oil that is shipped in trucks from the Grant Canyon and Trap Springs fields in Nevada. Because of the shutdown of the Sunbelt Refinery in August, only one refinery was operating in Arizona at the end of 1993.

Products transferred in 1993 through the two liquefied petroleum gas (LPG) storage well facilities near Luke Air Force Base and Holbrook included bout 58 million gallons in receipts and about 56 million gallons in deliveries. About 43 million gallons were in storage at the end of the year.

These facilities, AmeriGas near Luke ad Ferrellgas near Holbrook, store propane and iso, normal, and mixed butane in subsurface salt. Ferrellgas had a banner year for storage of LPG in 1993 and plans to add a deisobutanizer plant and may enlarge its storage capacity by drilling additional storage wells in the near future.

The commission held two regular meetings in 1993 and one hearing. The hearing was called to amend Dry Mesa Corporation's water-disposal permit at the Dry Mesa field to allow for disposal of produced Mississippian and Pennsylvanian water from the greater Dry Mesa-Black Rock fields.

Leasing decreased on State Trust land and increased on Federal land during the year. State Trust land under lease as of December 1993 totaled 38,715 acres, down from 72,593 acres in December 1992. Federal land under lease as of December 1993 totaled 120,366 acres, up from 109,279 acres in December 1992.

There were no applications for enhanced recovery projects or unitization in Arizona in 1993.

1994 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Five permits to drill were issued in 1994. The first was issued to Medallion Oil Company, Houston, Texas, for the 1-15 Federal, a 5000-foot wildcat north of Grand Canyon and about 40 miles south of St. George, Utah. The 1-15 Federal was completed as a dry hole in June. The second was issued to Ridgeway Arizona Oil Corporation, Calgary, Alberta, for the 1 Plateau Cattle Company, a 2431-foot test about 15 miles southeast of St. Johns, Arizona. The 1 Plateau Cattle Company was completed in July as a potential carbon dioxide and helium discovery. A production test in November produced about 700,000 cubic feet of 90% carbon dioxide and 0.6% helium gas per day with no drop in pressure. Another permit was issued to Ridgeway for the 1A Plateau Cattle Company, an offset to the No.1, to test shallow sands. The 1A was temporarily abandoned at the end of 1994. Finally, two permits were issued to Harken Energy, Dallas, Texas, for two development wells in the Black Rock gas field in northeastern Arizona. No drilling was reported at either of the new Black Rock locations in 1994.

Oil production in Arizona in 1994 totaled 64,748 barrels from 20 producing wells, down from 73,141 barrels produced in 1993. Gas production in 1994 totaled 760 million cubic feet from six producing gas wells, up from 618 million cubic feet produced in 1993. Twenty three wells were idle at the end of 1993.

The Intermountain Refinery near Fredonia produced 1,200 barrels of asphalt and naphtha in 1994, down from 153,540 barrels in 1993. The Williams Cos., Tulsa, Oklahoma, canceled its plans to build a 50,000 barrel-a-day refinery near Mobile because of higher than anticipated costs, inability to find a partner, and its acquisition of Transco Energy Co. If built, the refinery would obtain crude oil from the All American pipeline.

Products transferred in 1994 through the two liquefied-petroleum-gas (LPG) storage-well facilities near Phoenix and Holbrook included about 72 million gallons in receipts and about 76 million gallons in deliveries, up from the 58 million gallons received and 57 million gallons delivered in 1993. About 42 million gallons were in storage at the end of the year. The AmeriGas and Ferrellgas storage-well facilities store LPG products in caverns leached in subsurface salt.

The Oil and Gas Conservation Commission held four regular meetings in 1994. One issue resolved was getting the two abandoned geothermal wells southeast of Phoenix plugged. The

state's application for primacy over underground injection, revisions of injection rules, and future policy on federal and Indian lands were also discussed.

Oil and gas leasing increased on both State Trust and Federal land in 1994. State Trust land leased for oil and gas in December 1994 totaled 99,959 acres, up from 38,715 acres in December 1993. Federal land under lease in December 1994 totaled 165,247 acres, up from 120,366 acres in December 1993. Oil and gas leasing on State Trust land is noncompetitive.

1995 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Ten permits were issued and six wells were drilled in 1995 including on CO₂ discovery, one producing oil well, two junked and abandoned holes, and two dry holes. Ridgeway Arizona Oil Corporation, Calgary, extended its potential reserves of CO₂ in the St. Johns area with its 3-1 State, a confirmation well four miles south of the 1 Plateau Cattle, Ridgeway's initial CO₂ discovery in the St. Johns area. The 3-1 well produced 663,000 cu ft of 89 percent CO₂ gas per day. Ridgeway junked its 22-1 State at a depth of 218 feet, and has plans for five offset wells in 1996. Harken Southwest Corporation drilled two wells in its Black Rock Field under permits issued in 1994. It completed its Black Rock 20 as an oil producer and junked its Black Rock 7X at 40 feet. The Townsend Company, Abilene, Texas, completed its 1-26 State, a 2960-foot wildcat west of Winslow, as a dry hole in June. The 1-26 State was not drilled deep enough to reach its Devonian objectives. Arzon Corporation, Phoenix, drilled its 1 State to a depth of 8974 feet near San Simon before plugging back to the top of stuck pipe at 4000 feet. The Arzon 1 State was temporarily abandoned at yearend. Premco Western, Garland, Texas, set conductor pipe at 80 feet on its 8500-foot Paleozoic test in Mohave County about 14 miles south of St. George, Utah. The Premco well was shut in at a depth of 825 feet at yearend.

Oil production in Arizona in 1995 totaled 71,252 barrels from 21 producing wells, up from 64,748 barrels produced in 1994. Gas production in 1995 totaled 558 million cubic feet from 7 producing wells, down from 760 million cubic feet produced in 1994. Fourteen oil wells, 4 gas wells, and 2 disposal wells were shut-in, and 2 disposal wells were active at yearend.

The Intermountain Refinery near Fredonia delivered 506 barrels of naphtha in 1995, down from 1,200 barrels of naphtha and asphalt delivered in 1994. Receipts included 16,717 barrels of #4 burner and 6,655 barrels of red diesel, but no crude oil.

Products transferred in 1995 through the two liquefied-petroleum-gas (LPG) storage-well facilities near Phoenix and Holbrook included 88 million gallons in receipts and 101 million gallons in deliveries, up from the 71 million gallons received and 75 million gallons delivered in 1994. About 30 million gallons were in storage at yearend. AmeriGas and Ferrellgas store LPG products in caverns leached in subsurface salt.

The Oil and Gas Conservation Commission held three regular meetings in 1995. The Legislature initiated a bill to continue the Oil & Gas Conservation Commission through July 2006.

Acreage leased for oil and gas on State Trust and Federal land in Arizona decreased from 250,550 acres in December 1994 to 235,360 acres in December 1995. Oil and gas leases on State Trust Land totaled 105,280 acres in December 1995, down from 134,005 acres in December 1994. Federal land leased in December 1995 totaled 130,080 acres, up from 116,545 acres in December 1994. Leasing on State Trust Land is noncompetitive.

There were no enhanced recovery projects or unitization applications in 1995.

1996 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

One well, the PetroSun 15-1 NMAL, was permitted and drilled to a total depth of 3,648 feet in central Apache County Arizona in 1996. A strong kick of methane gas was reported in the PetroSun well at a depth of about 1,030 feet, and the well has been shut-in since July 1996 pending further evaluation in the area. The Premco Western well in Mohave County and the Arzon well in Cochise County remain shut-in. Ridgeway Arizona Oil Company reinstated its five permits in late 1996 and plans to start drilling more wells on its CO₂ prospect between St. Johns and Springerville as soon as favorable financing is arranged.

Oil production in Arizona in 1996 totaled 84,047 barrels from 22 producing wells, up from 71,067 barrels produced in 1995. Gas production in 1996 totaled 464 million cubic feet from 7 producing gas wells, down from 558 million cubic feet produced in 1995. Thirteen oil wells, 4 gas wells, and 1 disposal well were shut-in, and 3 disposal wells were active at yearend.

The Intermountain Refinery near Fredonia delivered no product in 1996, down from 506 barrels of naphtha delivered in 1995. Receipts included 2,094 barrels of #4 burner and 162 barrels of red diesel, but no crude oil.

Products transferred in 1996 through the two liquefied-petroleum-gas (LPG) storage-well facilities near Phoenix and Holbrook included 86 million gallons in receipts and 75 million gallons in deliveries, down from the 88 million gallons received and 101 million gallons delivered in 1995. About 40 million gallons were in storage at yearend, up from the 30 million gallons the previous year. AmeriGas and Ferrellgas store LPG products in caverns leached in subsurface salt.

The Oil and Gas Conservation Commission held two regular meetings in 1996. Arizona reduced the property tax assessment ratio for producing oil, gas, and geothermal interests to 28% of full cash value from 100%, effective with the 1996 tax year. The tax ratio will fall 1 percentage point each year until holding as 25% in 2000 and thereafter.

Total acreage leased for oil and gas in Arizona increased from 235,362 acres in December 1995 to 327,087 acres in December 1996. Oil and gas leases on State Trust land totaled 246,169 acres in December 1996, up from 105,280 acres in December 1995. Federal public land leased in December 1996 totaled 80,918 acres, down from 130,082 acres in December 1995. Leasing on State Trust land is noncompetitive with an annual rental of \$1.00 per acre.

1997 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Eleven wells were drilled in Arizona in 1997. Ridgeway Arizona Oil Corporation drilled these wells in the first half of 1997 in conjunction with its CO₂ project between St. Johns and Springerville. Ridgeway was still testing the wells at yearend.

Oil production in Arizona totaled 82,085 barrels from 25 producing wells in 1997, down from 84,047 barrels from 22 wells in 1996. Gas production totaled 453 million cubic feet from 8 producing wells in 1997, down from 464 million cubic feet from 7 wells in 1996. There were 3 active produced-water disposal wells; and 10 oil wells, 3 gas wells, and 1 disposal well were shut-in at yearend.

The two refineries in Arizona remained shut down in 1997.

There were 106 million gallons in receipts and 88 million gallons in deliveries transferred through the liquefied-petroleum-gas (LPG) storage-well facilities in 1997, up from the 86 million gallons and 75 million gallons delivered in 1996. About 57 million gallons were in storage t yearend, up from the 40 million gallons at yearend 1996. AmeriGas and Ferrellgas store LPG products in caverns leached in subsurface salt near Phoenix and Holbrook.

The Oil and Gas Conservation Commission held four regular meetings in 1997.

There were 380,000 acres leased for oil and gas in Arizona at yearend 1997, up from the 327,000 acres under lease at yearend 1996. Oil and gas leases on State Trust land totaled 310,000 acres in December 1997, up from 246,000 acres in December 1996. Federal land leased in December 1997 totaled 70,000 acres, down from 81,000 acres in December 1996. Leasing on State Trust land is noncompetitive and annual rental is \$1.00 per acre.

1998 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

One well was drilled and completed in Arizona in 1998. The well was completed by Coleman Oil and Gas, Inc. as a gas well at the Dry Mesa Field in northeast Arizona. Four of the five wells in the Teec Nos Pos Field were plugged by the U.S. Bureau of Land Management in November and December 1998. The Teec Nos Pos Field has been shut-in since 1990. Ridgeway continued testing its carbon dioxide wells near St. Johns during 1998.

Oil production in Arizona in 1998 totaled 78,109 barrels from 19 producing wells, down from 82,085 barrels from 25 wells in 1997. Gas production in 1998 totaled 457 million cubic feet from 8 producing gas wells, up from 453 million cubic feet from 8 wells in 1997. There were 18 shut-in wells at yearend including 12 oil wells, 3 gas wells, and 3 produced-water disposal wells. One disposal well was active at yearend.

The two refineries in Arizona remained shut down in 1997.

Liquefied petroleum gas (LPG) transferred in 1998 through storage wells near Luke Air Force Base and Adamana included 89 million gallons in receipts and 107 million gallons in deliveries, as compared to 106 million gallons received and 88 million gallons delivered in 1997. About 41 million gallons of LPG were in storage at yearend,, down from the 57 million gallons the previous year. AmeriGas and Ferrellgas store LPG products in 14 storage wells in subsurface salt near Phoenix and Holbrook.

The Oil and Gas Conservation Commission held 2 regular meetings in 1998.

There were 407,000 acres leased for oil and gas in Arizona at yearend 1998, up from the 380,000 acres under lease at yearend 1997. Oil and gas leases on State Trust land totaled 296,000 acres in December 1998, down from 310,000 acres in December 1997. Federal land leased in December 1998 totaled 111,000 acres, up from 70,000 acres in December 1997. Leasing on State Trust land is noncompetitive with an annual rental of \$1.00 per acre.

1999 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

One permit to drill was issued in Arizona in 1999 to Gus Berry to reenter the previously abandoned Townsend 26-1 State near Meteor Crater. Gus Berry deepened the 26-1 State to 3900 feet, ran casing, and was preparing to test Devonian strata at yearend. Premco Western

continued to drill at a depth of about 510 feet on its Dutchman Federal hole on the Arizona Strip. The last remaining well, a water disposal well, at the Teec Nos Pos Field was plugged by the U.S. Bureau of Land Management in April 1999. The Teec Nos Pos Field has been shut in since 1990. Coleman Oil & Gas plugged the 5 Navajo-138 well at the Dry Mesa Field. Pure Oil Company drilled and abandoned the 5 Navajo-138 in May 1960. Dry Mesa Corporation reentered and completed the 5 Navajo-138 in May 1992. The 5 Navajo-138 produced 560 barrels of oil and 134 million cubic ft of natural gas before it was plugged in November 1999. Ridgeway continued to test its carbon dioxide wells near St. Johns in 1999.

Oil production in Arizona in 1999 totaled 66,832 barrels from 24 producing wells, down from 78,109 barrels from 19 wells in 1998. Gas production in 1999 totaled 474 million cubic feet from 8 producing gas wells, up from 457 million cubic feet from8 wells in 1998. There were 12 shut-in wells at yearend including 6 oil wells, 4 gas wells, and 3 produced-water disposal wells. One disposal well was active at yearend.

The two refineries in Arizona remained shut down in 1999.

Liquefied petroleum gas (LPG) transferred in 1999 through storage wells near Luke Air Force Base and Adamana included 90 million gallons in receipts and 104 million gallons in deliveries, as compared to 89 million gallons received and 107 million gallons delivered in 1998. About 26 million gallons of LPG were in storage at yearend, down from the 40 million gallons the previous year. AmeriGas and Ferrellgas store LPG products in 14 storage wells in subsurface salt near Phoenix and Holbrook.

The Oil and Gas Conservation Commission held 3 regular meetings and 2 special meetings in 1999.

There were 314,500 acres leased for oil and gas in Arizona at yearend 1999, down from the 407,000 acres under lease at yearend 1998. Oil and gas leases on State Trust land totaled 203,000 acres in December 1999, down from 296,000 acres in December 1998. Federal land leased in December 1999 totaled 111,500 acres, up from 111,000 acres in December 1998. Leasing on State Trust land is noncompetitive with an annual rental of \$1.00 per acre. Leasing on federal land is competitive with an annual rental of \$1.50 per acre.

2000 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

One permit was issued in Arizona in 2000 to SunCor Development Company to drill a stratigraphic test in the Luke salt deposit near Phoenix. Mr. Gus Berry perforated his well near Meteor Crater in October 2000 but did not test it because a rig was not available. Premco Western was stuck at a depth of 2300 feet at its well in northwestern Arizona. Ridgeway continued to test its carbon dioxide wells near St. Johns in 2003.

Oil production in Arizona in 2000 totaled 57,483 barrels from 21 producing wells, down from 66,483 barrels from 24 wells in 1999. Gas production in 2000 totaled 368 million cubic feet from 9 producing gas wells, down from 474 million cubic feet from 8 wells in 1999. There were 14 shut-inn wells at yearend including 9 oil wells, 3 gas wells, and 2 produced-water disposal wells. One disposal well was active at yearend.

The two refineries in Arizona remained shut down in 2000. El Paso Energy announced in early 2001 that it would buy and convert the All American Pipeline to natural gas service. Conversion of the All American Pipeline eliminated the source of crude oil for the old Sunbelt refinery at Coolidge. The All American Pipeline was the only West Coast-to-Texas crude oil

pipeline and its conversion will undoubtedly end the perennial plans for a refinery at Mobile, Arizona.

Liquefied petroleum gas (LPG) transferred in 2000 through storage wells near Luke Air Force Base and Adamana included 108 million gallons in receipts and 97 million gallons in deliveries, as compared to 90 million gallons received and 104 million gallons delivered in 1999. About 38 million gallons of LPG were in storage at yearend, up from the 26 million gallons the previous year. AmeriGas and Ferrellgas store LPG products in 14 storage wells in subsurface salt near Phoenix and Holbrook.

The Oil and Gas Conservation Commission held 2 regular meetings in 2000. House Bill 2492 amended the confidentiality period for well records and procedure for publishing information about active oil and gas projects. The Commission revised its rules to incorporate the changes made in HB 2492.

There were 344,000 acres leased for oil and gas in Arizona at yearend 2000, up from the 314,500 acres under lease at yearend 1999. Oil and gas leases on State Trust land totaled 250,000 acres in December 2000, up from 203,000 acres in December 1999. Federal land leased in December 2000 totaled 94,000 acres, down from 111,500 acres in December 1999. Leasing on State Trust land is noncompetitive with an annual rental of \$1.00 per acre. Leasing on federal land is competitive with an annual rental of \$1.50 per acres.

2001 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

One hole was drilled under a permit issued in late 2000 and one hole was started under a permit issued in late 2001. In early 2001, the SunCor Development Company drilled a stratigraphic hole, the #1-2 SunCor, to test the storage potential of the Luke salt near Luke Air Force Base west of Phoenix. The #1-2 SunCor penetrated 4,263 ft of pure salt from 872 to 5,135 ft. The results of that hole were favorable. The new permit was issued to Copper Eagle Gas Storage, LLC in October 2001 to drill a 2nd stratigraphic hole near Luke Air Force Base to test sedimentary units adjacent to and below the salt for disposal of brine. Drilling started on that hole in late December. Mr. Gus Berry died in early 2001 and another operator has contacted the Commission about taking over and testing his hole near Meteor Crater. No test results were available at yearend. Premco Western's hole in northwestern Arizona, on the Arizona Strip, was shut-in at a depth of about 3,300 feet. Ridgeway Arizona Oil Corporation installed some gathering lines from two of its wells (10-22 State and 10-16-31 State) to a liquid-CO₂ plant site near the TEP Generating Station.

Oil production in Arizona in 2001 totaled 60,297 barrels from 23 producing wells, up from 57,483 barrels from 21 wells in 2000. Gas production in 2001 totaled 307 million cubic feet from 8 producing gas wells, down from 368 million cubic feet from 9 wells in 2000. There were 13 shut-in wells at yearend including 6 oil wells, 5 gas wells, and 2 produced-water disposal wells. One disposal well was active at yearend. No carbon dioxide was produced in 2001.

The two refineries in Arizona remained shut down in 2001. The Sunbelt Refinery near Coolidge has been mothballed since August 1993. The Intermountain Refinery near Fredonia hasn't purchased crude oil since December 1993, shipped its last product (naphtha) in May 1994, and opted not to renew its distributor license in January 1997. It is currently shut-in with respect to crude oil and has been engaged in terminaling and storage of asphalt products since May 1994. El Paso Energy continued its conversion of the All American Pipeline to natural gas

service. Questar continued its conversion of the Four Corners crude oil pipeline to natural gas service.

Liquefied petroleum gas (LPG) transferred in 2001 through storage wells near Luke Air Force Base and Adamana included 127 million gallons in receipts and 107 million gallons in deliveries, as compared to 108 million gallons received and 97 million gallons delivered in 2000. About 60 million gallons of LPG were in storage at yearend, up from the 38 million gallons the previous year. AmeriGas and Ferrellgas store LPG products in 14 storage wells in subsurface salt near Phoenix and Holbrook.

The Oil and Gas Conservation Commission held 3 regular meetings and completed a five-year review of its rules in 2001. The Commission proposed to amend two rules as a result of its five-year review.

There were 381,000 acres leased for oil and gas in Arizona at yearend 2001, up from the 344,000 acres under lease at yearend 2000. Oil and gas leases on State Trust land totaled 274,500 acres in December 2001, up from 250,000 acres in December 2000. Federal land leased in December 2001 totaled 106,500 acres, up from 94,000 acres in December 2000. Leasing on State Trust land is noncompetitive with an annual rental of \$1.00 per acres. Leasing on federal land is competitive with an annual rental of \$1.50 per acre.

2002 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Five drilling permits were issued and three wells were drilled in 2002. The first permit was issued to Aquila Storage and Transportation for a stratigraphic hole north of the Red Lake Playa. Aquila never drilled the hole. The second permit was issued to High Plains Petroleum to reenter the Ridgeway 12-16-28 State near St. Johns. High Plains never reentered the hole. Two permits were issued to Copper Eagle Gas Storage LLC for two stratigraphic holes to test the suitability of strata below the Luke salt for disposal of brine. The first hole, 1-19 SunCor, was drilled to a total depth of 8307 ft in July. The second, the 1-12 Kakerlee, was drilled to a total depth of 6053 ft in September. Copper Eagle drilled a previous hole, the 1-24 SunCor, to a total depth of 6053 ft in February. The 1-24 was permitted in 2001. Copper Eagle temporarily abandoned all three holes pending additional testing. The last permit was issued after-the-fact to Red Lake Gas Storage LP for a stratigraphic hole it drilled north of the Red Lake Playa in December 2001. That hole, the Red Lake 1D, previously referred to as the Pataya Test Well 1, was drilled to a total depth of 3163 ft to test the suitability of strata north of the Red lake salt for disposal of brine. No activity was reported at the wells near Meteor Crater or on the Arizona Strip.

Ridgeway Arizona Oil Corporation started producing carbon dioxide (CO₂) from its 10-22 State well in July. All production is being piped to a liquid plant operated by Reliant Gas near the TEP Generating Station.

Oil production totaled 63,417 barrels from 20 producing wells in 2002, up from 60,297 barrels from 23 wells in 2001. Gas production totaled 304 million cubic feet from 7 producing gas wells, down from 307 million cubic feet from 8 wells in 2001. There were 15 shut-in wells at yearend including 10 oil, 5 gas, and 1 disposal well. Two disposal wells were active. CO₂ production totaled 217 million cubic feet from 1 producing well in 2002.

The two refineries in Arizona remained shut down in 2002. The Sunbelt Refinery near Coolidge has been mothballed since August 1993. The Intermountain Refinery near Fredonia has

been transferring and storing asphalt products since May 1994. El Paso completed its conversion of the All American Pipeline to natural gas service. Questar completed its conversion of the Four Corners crude oil pipeline to natural gas service. There are no crude pipelines in Arizona.

Liquefied petroleum gas (LPG) transferred in 2002 through storage wells near Phoenix and Holbrook included 90 million gallons in receipts and 122 million gallons in deliveries, as compared to 127 million gallons received and 107 million gallons delivered in 2001. About 29 million gallons of LPG were in storage at yearend, down from the 60 million gallons the previous year.

The Oil and Gas Conservation Commission held 4 regular meetings and amended two rules in 2002.

There were 438,000 acres leased for oil and gas in Arizona at yearend 2002, up from the 381,000 acres at yearend 2001. Oil and gas leases on State Trust land totaled 324,000 acres in December 2002, up from 274,500 acres in December 2001. Federal land leased in December 2002 totaled 114,000 acres, up from 106,500 acres in December 201.

2003 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Two drilling permits were issued, one well was drilled, and one well was reentered in 2003. The first permit was issued to Clayton Williams Energy for a gas test in Coconino County near Grey Mountain, about 40 miles northeast of Flagstaff. Clayton Williams completed the well, the 1 Babbitt, sw nw 15-27n-9e, as a dry hole at a depth of 4350 ft in December. The 1 Babbitt yielded water from production tests of the Cambrian Tapeats sandstone and penetrated about 600 ft of Walcott shale beneath the Tapeats. The Walcott shale is a hydrocarbon source rock in the upper part of the Precambrian Chuar Group of rocks. The second permit was issued to High Plains Petroleum to reenter the Combined Drilling Venture 1B State about 5 miles south of St. Johns. High Plains did not reenter the Combined Drilling hole before yearend. High Plains Petroleum reentered the Ridgeway 12-16-28 State at about 4 miles south of St. Johns in September on a permit issued in 2002. High Plains reported some pressure and a blow of gas in a test of some sands in the Amos Wash member of the Permian Supai formation. No activity was reported at the wells near Meteor Crater or on the Arizona Strip.

The presence of radon in the CO₂ caused Ridgeway Arizona Oil Corporation to shut-in its 10-22 State well in July 2003. The 10-22 State remained shut-in through the end of the year. All CO₂ production was piped to Reliant Gases' liquid plant near the TEP Generating Station.

Oil production totaled 47,289 barrels from 16 producing wells in 2003, down from 63,417 barrels from 20 wells in 2002. Gas production totaled 443 million cubic feet from 9 producing gas wells, up from 304 million cubic feet from 7 wells in 2002. The notable increase in gas production was a result of the start of production of helium-rich gas from Devonian strata at the Dineh-bi-Keyah field in April. Gas from the Dineh-bi-Keyah field is shipped through a pipeline to the Newpoint Gas Services helium gas plant south of Ship Rock in New Mexico. There were 17 shut-in wells at yearend including 13 oil, 4 gas, and 1 disposal well. Two disposal wells were active. CO₂ production totaled 159 million cubic feet from 1 producing well in 2003.

The two refineries in Arizona remained shut down in 2003. The Sunbelt Refinery near Coolidge has been mothballed since August 1993. The Intermountain Refinery near Fredonia has been transferring and storing asphalt products since May 1994.

Liquefied petroleum gas (LPG) transferred in 2003 through storage wells near Phoenix and Holbrook included 85 million gallons in receipts and 80 million gallons in deliveries, as compared to 90 million gallons received and 122 million gallons delivered in 2002. About 35 million gallons of LPG were in storage at yearend, up from the 29 million gallons in 2002.

The Oil and Gas Conservation Commission held 2 regular meetings in 2003.

There were 481,000 acres leased for oil and gas in Arizona at yearend 2003, up from the 438,000 acres at yearend 2002. Oil and gas leases on State Trust land totaled 376,000 acres in December 2003, up from 324,000 acres in December 2002. Federal land leased in December 2003 totaled 105,000 acres, down from 114,000 acres in December 2002.

2004 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Eight drilling permits were issued, four wells were drilled, and two wells permitted in previous years were plugged in 2004. Three permits were issued to Ridgeway Arizona Oil Corp in April and one permit was issued to Salt Grass Exploration in May for wells in the St Johns – Springerville area. Only one of the wells was drilled. Ridgeway drilled the 11-18 State in c sw 18-11n-30e to a depth of 2535 ft as a CO₂ test in May. The 11-18 State is currently shut-in. Ridgeway intermittently evaluated the hole and waited on equipment through the end of the year. Holbrook Energy LLC permitted and drilled the 35-1 Hortenstine in ne sw 35-20n-26e to a depth of 1050 ft as a helium test in the old Pinta Dome field in September. The 35-1 Hortenstine is currently shut-in waiting on a slim-hole completion attempt. Gruy Petroleum permitted and drilled two wells in November to test the helium potential south of Sanders. Gruy drilled the 12-11 Santa Fe Goodyear in ne sw 12-20n-28e to a depth of 1025 ft and the 24-6 Santa Fe Whispership in se nw 24-20n-28e to a depth of 1213 ft. Both wells are currently shut in pending additional drilling to determine if there is enough volume of helium-bearing gas in the area to justify rebuilding a helium extraction plant at Navajo. McCabe Energy permitted a well north of Flagstaff as a test of the Cambrian Tapeats Sandstone near Gray Mountain in October. McCabe had not started work on the well as of yearend. Two wells permitted in previous years were plugged in 2004. High Plains Petroleum plugged the 12-16-28 State in nw ne 16-12n-28e about 4 miles south of St. Johns and Holbrook Energy plugged the 26-1 State in 26-19n-13e near Meteor Crater.

Reliant Gases' liquid CO₂ plant near the TEP Generating Station ceased production in February 2004.

Oil production totaled 51,341 barrels from 16 producing wells in 2004, up from 47,289 barrels from 16 wells in 2003. Gas production totaled 331 million cubic feet from 6 producing gas wells, down from 443 million cubic feet from 9 wells in 2003. CO₂ production totaled 2 million cubic feet from one producing well in 2004, down from 159 million cubic feet in 2003. Commercial production of CO₂ started in July 2002. There were 22 shut-in wells at yearend including 11 oil, 9 gas, 1 CO₂, and 1 disposal well. Two disposal wells were active.

The two refineries in Arizona remained shut down in 2004. The Sunbelt Refinery near Coolidge has been mothballed since August 1993. The Intermountain Refinery near Fredonia has been transferring and storing asphalt products since May 1994.

Liquefied petroleum gas (LPG) transferred in 2004 through storage wells near Phoenix and Holbrook included 81 million gallons in receipts and 82 million gallons in deliveries, as compared to 85 million gallons received and 8-0 million gallons delivered in 2003. About 25

million gallons of LPG were in storage at yearend, down from the 35 million gallons in 2003. Fourteen storage wells in subsurface salt are in use.

The Oil and Gas Conservation Commission held 3 regular meetings in 2004.

There were 353,000 acres leased for oil and gas in Arizona at yearend 2004, down from the 481,000 acres at yearend 2003. Oil and gas leases on State Trust land totaled 256,000 acres in December 2004, down from 376,000 acres in December 2003. Federal land leased in December 2004 totaled 97,000 acres, down from 105,000 acres in December 2003.

2005 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Nine drilling permits were issued, seven wells were drilled, and six wells were plugged in 2005. Unocal and El Paso Natural Gas drilled three stratigraphic tests to investigate the feasibility of storing natural gas in the Picacho basin. Unocal drilled the 1-27 Mesa in se sw 27-7s-8e to a total depth of 4895 ft in February. El Paso drilled the 1-20 State in c ne 20-7s-8e to a total depth of 3316 ft in August and the 1-11 State in sw ne 11-7s-8e to a total depth of 3170 ft in September. All three stratigraphic wells were plugged. Unocal (now Chevron) and El Paso are holding the information from the stratigraphic tests confidential. Holbrook Energy LLC drilled the 17-1 NZ in ne nw 17-14n-25e to a depth of 2320 ft as a test of the Supai formation near Concho in February. The 17-1 NZ is temporarily abandoned waiting on additional funding and testing. McCabe Energy drilled the 1 Babbitt in ne sw 9-27n-9e to a total depth of 3445 ft as a test of the Cambrian Tapeats Sandstone north of Flagstaff in August. McCabe plugged the 1 Babbitt back to the base of the fresh water and turned the hole over to the Babbitt Ranches for use as a water well. Arizona Public Service Company (APS) permitted three temperature gradient holes near Clifton but only drilled two. APS drilled the TG 1-05 Fee in ne sw 18-4s-30e to a total depth of 635 ft and the TG 3-05 Fee in nw nw 19-4s-30e to a total depth of 1000 ft late in the year. APS completed the two wells to monitor temperature gradients in the area. Gruy Petroleum plugged and abandoned the 12-11 Santa Fe Goodyear and the 24-6 Santa Fe Whispership in August 2005. Gruy drilled the two holes in search of helium in November 2004. RIM Southwest Corporation plugged four wells in northeastern Arizona. RIM plugged the 6 Navajo-138 well at the Dry Mesa field in October 2005. Monsanto Company completed the 6-Navajo-138 in August 1985. The 6-Navajo produced 124,449 barrels of oil and 138 million cubic ft of natural gas before it was plugged in October 2005. RIM plugged the 1, 5, and 8 Black Rock wells at the Black Rock field in October 2005. Cities Service Company completed the 1 Black Rock (1 Navajo-A) in September 1971. The 1 Black Rock produced 936 barrels of oil and 922 million cubic ft of natural gas before it was plugged. Chuska Energy Company completed the 5 and 8 Black Rock wells in March 1990. The 5 Black Rock produced 4422 barrels of oil and 1.3 billion cubic ft of natural gas before it was plugged. The 8 Black Rock produced 3560 barrels of oil and 1.02 billion cubic ft of natural gas before it was plugged.

Oil production totaled 50,251 barrels from 18 producing wells in 2005, down from 51,341 barrels from 16 wells in 2004. Gas production totaled 233 million cubic feet from 6 producing gas wells, down from 331 million cubic feet from 6 wells in 2004. Four gas wells were plugged in 2005. Three were in the Black Rock Field and one was in the Dry Mesa Field. No CO2 was produced in 2005. There were 17 shut-in wells at yearend including 10 oil, 4 gas, 1 CO2, and 2 disposal wells. One disposal well was active.

The two refineries in Arizona remained shut down in 2005. The Sunbelt Refinery near Coolidge has been mothballed since August 1993. The Intermountain Refinery near Fredonia has been transferring and storing asphalt products since May 1994.

Liquefied petroleum gas (LPG) transferred in 2005 through storage wells near Phoenix and Holbrook included 101 million gallons in receipts and 90 million gallons in deliveries, as compared to 81 million gallons received and 82 million gallons delivered in 2004. About 32 million gallons of LPG were in storage at yearend, down from the 25 million gallons in 2004. There are currently fourteen storage wells in subsurface salt.

The Oil and Gas Conservation Commission held 4 regular meetings in 2005.

There were 475,000 acres leased for oil and gas in Arizona at yearend 2005, up from the 353,000 acres at yearend 2004. Oil and gas leases on State Trust land totaled 378,000 acres in December 2005, up from 256,000 acres in December 2004. Federal land leased in December 2005 totaled 97,000 acres, equal to 97,000 acres in December 2004.

2006 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Twelve drilling permits were issued and three wells were drilled in 2006. Ultimate Exploration and Development drilled the 2 Short Creek Federal in ne sw 35-41n-7w to a total depth of 7690 ft as a test of Paleozoic units near Colorado City in April. Ultimate plugged the 2 Short Creek as a dry hole. El Paso Natural Gas drilled the 1-21 AGS in sw nw 21-7s-8e to a total depth of 8784 ft as a stratigraphic test in October. The 1-21 AGS is temporarily abandoned pending additional testing and analysis. High Plains Petroleum drilled the 17-1 Santa Fe in ne ne 17-12n-26e to a total depth of 4032 ft as a test of the Supai formation and Redwall limestone near Concho in October. The 17-1 Santa Fe is temporarily abandoned waiting on additional testing and analysis. Ridgeway Arizona Oil Corporation permitted nine wells between St Johns and Springerville late in 2006 but did not start drilling before the end of the year. Holbrook Energy LLC submitted notice in October to plug and abandon its 35-1 Hortenstine. Holbrook Energy drilled the 35-1 Hortenstine as a helium test in the old Pinta Dome field in September 2004.

Oil production totaled 54,807 barrels from 20 producing wells in 2006, up from 50,251 barrels from 18 wells in 2005. Gas production totaled 608 million cubic feet from 7 producing gas wells, up from 233 million cubic feet from 6 wells in 2005. No CO2 was produced in 2006. There were 20 shut-in wells at yearend including 17 oil, 1 gas, 1 CO2, and 2 disposal wells. One disposal well was active.

The two refineries in Arizona remained shut down in 2006. The Sunbelt Refinery near Coolidge has been mothballed since August 1993. The Intermountain Refinery near Fredonia has been transferring and storing asphalt products since May 1994.

Liquefied petroleum gas (LPG) transferred in 2006 through storage wells near Phoenix and Holbrook included 113 million gallons in receipts and 97 million gallons in deliveries, as compared to 101 million gallons received and 90 million gallons delivered in 2005. About 43 million gallons of LPG were in storage at yearend, up from the 32 million gallons in 2005. There are currently fourteen storage wells in subsurface salt. AmeriGas owns and operates the LPG facility near Phoenix. Ferrellgas sold its LPG storage facility near Holbrook to Enterprise Products in 2006.

The Oil and Gas Conservation Commission (OGCC) underwent a sunset review, held four regular meetings, completed a five-year review of its rules, and started a new web page in 2006. The web page, www.azogcc.az.gov, includes printable forms, recently issued permits, production data, and links to rules and statutes in addition to other helpful information. The

Arizona State Legislature continued the OGCC to July 1, 2016 when the OGCC will undergo its next sunset review.

There were 401,000 acres leased for oil and gas in Arizona at yearend 2006, down from the 475,000 acres at yearend 2005. Oil and gas leases on State Trust land totaled 330,000 acres in December 2006, down from 378,000 acres in December 2005. Federal land leased in December 2006 totaled 71,000 acres, down from 97,000 acres in December 2005.

2007 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Three drilling permits were issued, eleven wells were drilled, and one well was plugged and abandoned in 2007. Ridgeway Arizona Oil Corporation permitted three wells between St Johns and Springerville in early 2007 and started drilling eleven wells including nine wells permitted in 2006. Ridgeway drilled and tested several of the wells in 2007 and was preparing to finish drilling and test several of the wells at yearend. High Plains Petroleum plugged and abandoned the 17-1 Santa Fe in late 2007 after testing numerous shows of oil and gas. High Plains drilled the 17-1 Santa Fe in ne ne 17-12n-26e to a total depth of 4032 ft near Concho in 2006. Holbrook Energy LLC submitted notice plug and abandon its 35-1 Hortenstine in late 2006 but had not plugged the hole by yearend 2007. Holbrook Energy drilled the 35-1 Hortenstine as a helium test in the old Pinta Dome field in September 2004.

Oil production totaled 42,692 barrels from 18 producing wells in 2007, down from 54,807 barrels from 20 wells in 2006. Gas production totaled 650 million cubic feet from 7 producing gas wells, up from 608 million cubic feet from 7 wells in 2006. No CO₂ was produced in 2007. There was one active disposal well and 23 shut-in wells at yearend including 20 oil, 1 gas, 1 CO₂, and 2 disposal wells.

The two refineries in Arizona remained shut down in 2007. The Sunbelt Refinery near Coolidge has been mothballed since August 1993. The Intermountain Refinery near Fredonia has been transferring and storing asphalt products since May 1994.

Liquefied petroleum gas (LPG) transferred in 2007 through storage wells near Phoenix and Holbrook included 152 million gallons in receipts and 137 million gallons in deliveries, as compared to 113 million gallons received and 97 million gallons delivered in 2006. About 89 million gallons of LPG were in storage at yearend, up from the 43 million gallons in 2006. There are currently fourteen storage wells in subsurface salt near Phoenix and Holbrook. AmeriGas sold its LPG storage facility near Phoenix to Plains LPG Services LP in 2007. Enterprise Products owns and operates the LPG facility near Holbrook.

The Oil and Gas Conservation Commission held three regular meetings and amended two of its rules, R12-7-115 and R12-7-121, in 2007. The amended rules and links to all rules and statutes may be found on the Commission's web page at www.azogcc.az.gov. Stephen Cooper of Casa Grande replaced Joe Lane of Phoenix on the Commission.

There were 1.075 million acres leased for oil and gas in Arizona at yearend 2007, up from the 401,000 acres at yearend 2006. Oil and gas leases on State Trust land totaled 707,000 acres in December 2007, up from 330,000 acres in December 2006. Federal land leased in December 2007 totaled 368,000 acres, up from 71,000 acres in December 2006.

2008 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Thirty drilling permits were issued, 14 wells were drilled, and two wells were plugged and abandoned in 2008. Ridgeway Arizona Oil Corporation permitted 27 wells, drilled 13 wells, and plugged two wells at its CO₂ project between St Johns and Springerville in 2008. Wind River II Corporation permitted two wells in northwestern Arizona, the 10-1 Ft Pierce Federal in ne se 10-41n-11w and the 18-1D Dutchman Federal in se se 18-37n-9w. Wind River drilled the 10-1 Ft Pierce to a total depth of 5006 ft in December, bottoming in the Devonian Temple Butte formation. Wind River received approval from the U.S. Bureau of Land Management to suspend the 10-1 Ft Pierce well after testing and logging the Mississippian Redwall limestone and secondary objectives in Permian formations until the summer of 2009 and postponed the drilling of the 18-1D Dutchman. APS (Arizona Public Service) permitted the 1 Cholla CO₂ Test Fee to a proposed total depth of 4500 ft near the Cholla power plant in nw se 30-18n-20e. APS plans to commence drilling the 1 Cholla CO₂ stratigraphic test in February or March 2009. Holbrook Energy LLC submitted notice to plug and abandon its 35-1 Hortenstine in late 2006 but had not plugged the hole by yearend 2008. Holbrook Energy drilled the 35-1 Hortenstine as a helium test in the old Pinta Dome field in September 2004.

Oil production totaled 51,575 barrels from 21 producing wells in 2008, up from 42,692 barrels from 18 wells in 2007. Gas production totaled 523 million cubic feet from 6 producing gas wells, down from 650 million cubic feet from 7 wells in 2007. No CO₂ was produced in 2008. There was one active disposal well and 20 shut-in wells at yearend including 15 oil, 2 gas, 1 CO₂, and 2 disposal wells.

There are currently no oil and gas refineries in Arizona

Liquefied petroleum gas (LPG) transferred in 2008 through storage wells near Phoenix and Holbrook included 182 million gallons in receipts and 182 million gallons in deliveries, as compared to 152 million gallons received and 137 million gallons delivered in 2007. About 89 million gallons of LPG were in storage at yearend, equal to the 89 million gallons in 2007. There are currently fourteen storage wells in subsurface salt near Phoenix and Holbrook. Plains LPG Services LP owns and operates the LPG facility near Phoenix. Enterprise Products owns and operates the LPG facility near Holbrook.

The Oil and Gas Conservation Commission held four regular meetings in 2008. In its October meeting, the Commission denied an appeal by Mr. Gary Kiehne of its July decision to reclassify the Ridgeway 11-21 State (Permit 895) from temporarily abandoned to shut-in status. Governor Janet Napolitano appointed Ms. Katosha Nakai of Phoenix to replace Mr. Robert Wagner of Mesa on the Commission. Links to rules and statutes and other information about oil and gas in Arizona may be found on the Commission's web page at www.azogcc.az.gov.

There were 1.376 million acres leased for oil and gas in Arizona at yearend 2008, up from the 1.075 million acres at yearend 2007. Oil and gas leases on State Trust land totaled 1.018 million acres in December 2008, up from 707,000 acres in December 2007. Federal land leased in December 2008 totaled 358,000 acres, up from 368,000 acres in December 2007.

2009 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Nine drilling permits were issued, seven wells were drilled and two oil wells and one gas well were plugged in Arizona in 2009. Ridgeway Arizona Oil Corporation drilled one well at its

ongoing CO₂ project between St Johns and Springerville. APS (Arizona Public Service) drilled its Cholla CO₂ stratigraphic well in nw se 30-18n-20e to a total depth of 3853 ft near the Cholla power plant at Joseph City in late August. APS drilled the well to test the potential of sequestering CO₂ in deep saline aquifers of Devonian age near the power plant. APS will plug the Cholla well because no permeable and porous formations were encountered. The Cholla test was drilled as part of the West Coast Carbon Sequestration Partnership (WESTCARB). WESTCARB has posted the progress of the Cholla well on it's website at http://www.westcarb.org/. Additional information about the potential for carbon sequestration in Arizona can be found at http://www.azogcc.az.gov/. Willcox Greenhouse LLC drilled a well to a total depth of 4000 ft at its greenhouse north of Willcox. Willcox Greenhouse encountered water that is not hot enough to generate electrical power but is hot enough to help heat its greenhouses. Southwest Exploration and Passport Metals drilled four of five stratigraphic wells at their potash project southeast of Holbrook. Southwest and Passport plan to drill more wells in 2010 to further delineate the extent and grade of the potash deposits. RIM Southwest Corporation plugged the 2 Navajo-138 well at the Dry Mesa field in northeastern Arizona. Texas Pacific Coal and Oil completed the 2 Navajo-138 in May 1960. It produced 12,200 barrels of oil and 1.1 billion cubic ft of natural gas before it was plugged in September 2009. Elm Ridge Exploration plugged the 2 Navajo well at the East Boundary Butte field in northeastern Arizona. Shell Oil Company completed the 2 Navajo in December 1954 as a gas well. It produced 22,179 barrels of oil and 1.8 billion cubic ft of natural gas before it was plugged in October 2009. Elm Ridge also plugged the 3-11 Navajo well at the East Boundary Butte field. Consolidated Oil and Gas Inc. completed the 3-11 Navajo in May 1969 as an oil well. It produced 11,323 barrels of oil and 83.5 million cubic ft of natural gas before it was plugged in October 2009. Holbrook Energy LLC submitted notice to plug and abandon its 35-1 Hortenstine in late 2006 but had not plugged the hole by yearend 2009. Holbrook Energy drilled the 35-1 Hortenstine as a helium test in the old Pinta Dome field in September 2004.

Oil production totaled 46,193 barrels from 16 producing wells in 2009, down from 51,575 barrels from 21 wells in 2008. Gas production totaled 712 million cubic feet from 6 producing gas wells, up from 523 million cubic feet from 6 wells in 2008. No CO₂ was produced in 2009. There was one active disposal well and 18 shut-in wells at yearend including 14 oil, 1 gas, 1 CO₂, and 2 disposal wells.

There are currently no oil and gas refineries in Arizona

Liquefied petroleum gas (LPG) transferred in 2009 through storage wells near Phoenix and Holbrook included 144 million gallons in receipts and 171 million gallons in deliveries, as compared to 182 million gallons received and 182 million gallons delivered in 2008. About 62 million gallons of LPG were in storage at yearend, down from 89 million gallons in 2008. There are currently fourteen storage wells in subsurface salt near Phoenix and Holbrook. Plains LPG Services LP owns and operates the LPG facility near Phoenix. Enterprise Products owns and operates the LPG facility near Holbrook.

The Oil and Gas Conservation Commission held four regular meetings in 2009. Governor Jan Brewer appointed Robert L. Wagner to the AZOGCC to replace outgoing Commissioner Robert L. Jones. Mr. Wagner's appointment runs until January 2013. Governor Brewer reappointed Commissioner Michele P. Negley. Ms. Negley's reappointment runs until January 2014. Governor Brewer appointed Frank Thorwald to replace Commissioner Katosha Nakai. Mr. Thorwald's appointment runs until January 2015. Links to rules and statutes and other information about oil and gas in Arizona may be found on the Commission's web page at www.azogcc.az.gov.

There were 1.319 million acres leased for oil and gas in Arizona at yearend 2009, down from the 1.376 million acres at yearend 2008. Oil and gas leases on State Trust land totaled 961,000

acres in December 2009, down from 1.018 million acres in December 2008. Federal land leased in December 2009 totaled 358,000 acres, unchanged from 358,000 acres in December 2008.

2010 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Twenty three drilling permits were issued, five wells were drilled and two wells were plugged in Arizona in 2010. Potash Green LLC drilled two stratigraphic wells at its potash project east of Petrified Forest National Park near Holbrook in June. HNZ Potash permitted 10 stratigraphic wells east of Petrified Forest National Park and plans to start drilling early in 2011. Southwest Exploration/Passport Potash permitted eight wells west of Petrified Forest National Park and planned to start drilling in late 2010 or early 2011. Passport had not reported any drilling activity by the end of 2010. Ridgeway Arizona Oil Corporation drilled three wells in its recently approved carbon dioxide unit between St Johns and Springerville. APS (Arizona Public Service) plugged its stratigraphic well near the Cholla power plant at Joseph City because no permeable and porous formations were encountered. SunCor Development Company plugged its Kakerlee well near Luke in December. The Kakerlee well was drilled by Copper Eagle Gas Storage in September 2002. Holbrook Energy LLC submitted notice to plug and abandon its 35-1 Hortenstine in late 2006 but had not plugged the hole by yearend 2010. Holbrook Energy drilled the 35-1 Hortenstine as a helium test in the old Pinta Dome field in September 2004.

Oil production totaled 40,137 barrels from 14 producing wells in 2010, down from 46,193 barrels from 16 wells in 2009. Gas production totaled 183 million cubic feet from 5 producing gas wells, down from 712 million cubic feet from 6 wells in 2009. No CO₂ was produced in 2010. There was one active disposal well and 20 shut-in wells at yearend including 16 oil, 2 gas, 1 CO₂, and 2 disposal wells.

There are currently no oil and gas refineries in Arizona

Liquefied petroleum gas (LPG) transferred in 2010 through storage wells near Phoenix and Holbrook included 151 million gallons in receipts and 162 million gallons in deliveries, as compared to 144 million gallons received and 171 million gallons delivered in 2009. About 68 million gallons of LPG were in storage at yearend, up from 62 million gallons in 2009. There are currently fourteen storage wells in subsurface salt near Phoenix and Holbrook. Plains LPG Services LP owns and operates the LPG facility near Phoenix. Enterprise Products owns and operates the LPG facility near Holbrook.

The Oil and Gas Conservation Commission held four regular meetings in 2010. Current commission members include J. Dale Nations, Tucson, Chairman; Stephen R. Cooper, Casa Grande; Frank Thorwald, Show Low; Robert L. Wagner, Mesa; and Maria Baier, ex-officio member and State land Commissioner. Links to rules and statutes and other information about oil and gas in Arizona may be found on the Commission's web page at www.azogcc.az.gov.

There were 710,000 acres leased for oil and gas in Arizona at yearend 2010, down from the 1.319 million acres at yearend 2009. Oil and gas leases on State Trust land totaled 352,000 acres in December 2010, down from 961,000 acres in December 2009. Federal land leased in December 2010 totaled 358,000 acres, unchanged from 358,000 acres in December 2009.

2011 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Seventy five drilling permits were issued, which set a record for the number of permits issued in a single year, 67 wells were drilled and two wells were plugged in Arizona in 2011. All

but two permits and all wells drilled were stratigraphic tests for potash east of Holbrook. The two non-potash related permits were for obligation wells at the St Johns Gas Unit. Southwest Exploration/Passport Potash drilled 31 wells at its potash project west, southwest, and east of Petrified National Park near Holbrook. HNZ Potash drilled 24 stratigraphic wells southwest and east of Petrified Forest National Park. American West Potash drilled 12 wells at its potash project east of Petrified Forest National Park. The companies are required to permit the potash test wells with the Oil and Gas Conservation Commission because the holes penetrate the Coconino Sandstone, which is a potential helium reservoir in the area of the Petrified Forest National Park. Ridgeway Arizona Oil Corporation permitted two obligation wells at its St Johns Gas Unit. However, Enhanced Oil Resources (Ridgeway Arizona Oil Corporation) announced the sale of its carbon dioxide properties between St Johns and Springerville and in adjacent New Mexico to Kinder Morgan CO₂ Company. Ridgeway did not plan to drill the two wells until the sale was closed. Nacogdoches Oil & Gas, Inc. plugged the 10 Navajo well at the Dineh-bi-Keyah Field in northeastern Arizona. Kerr-McGee Corporation drilled the 10 Navajo in January 1968. The 10 Navajo produced 116,000 barrels of oil, 192,000 barrels of water and 21 million cubic ft of natural gas before Kerr-McGee converted it to a produced-water disposal well in June 1976. A little more than 4 million barrels of produced water were pumped back into the Dineh-bi-Keyah reservoir before it was plugged in July 2011. El Paso Natural Gas Company plugged its AGS 1-21 stratigraphic well north of Eloy in the Picacho Basin. El Paso drilled the well in 2006 to test the feasibility of storing natural gas in subsurface salt. El Paso found sufficient salt to store gas but concluded that the market demand for storage was not economical at this time. Holbrook Energy LLC submitted notice to plug and abandon its 35-1 Hortenstine in late 2006 but had not plugged the hole by yearend 2011. Holbrook Energy drilled the 35-1 Hortenstine as a helium test in the old Pinta Dome field in September 2004.

Oil production totaled 36,925 barrels from 9 producing wells in 2011, down from 40,137 barrels from 14 wells in 2010. Gas production totaled 168 million cubic feet from 5 producing gas wells, down from 183 million cubic feet from 5 wells in 2010. No CO₂ was produced in 2011. There were two active disposal wells and 24 shut-in wells at yearend including 20 oil, 2 gas, 1 CO₂, and 1 disposal well. One disposal well was plugged in 2011.

There are currently no oil and gas refineries in Arizona

Liquefied petroleum gas (LPG) transferred in 2011 through storage wells near Phoenix and Holbrook included 154 million gallons in receipts and 160 million gallons in deliveries, as compared to 151 million gallons received and 162 million gallons delivered in 2010. About 61 million gallons of LPG were in storage at yearend, down from 68 million gallons in 2010. There are currently fourteen storage wells in subsurface salt near Phoenix and Holbrook. Plains LPG Services LP owns and operates the LPG facility near Phoenix. Enterprise Products owns and operates the LPG facility near Holbrook.

The Oil and Gas Conservation Commission held three regular meetings and one hearing to consider a spacing request in 2011. The Commission granted an application by Ridgeway Arizona Oil Corporation to drill and produce carbon dioxide and helium gas wells on 160-acre spacing units in its St Johns Gas Unit in Apache County. Current commission members include J. Dale Nations, Tucson, Chairman; Stephen R. Cooper, Casa Grande; Frank Thorwald, Show Low; Robert L. Wagner, Mesa; and Maria Baier, ex-officio member and State land Commissioner. Links to rules and statutes and other information about oil and gas in Arizona may be found on the Commission's web page at www.azogcc.az.gov.

There were 511,000 acres leased for oil and gas in Arizona at yearend 2011, down from the 710,000 acres at yearend 2010. Oil and gas leases on State Trust land totaled 479,000 acres in December 2011, up from 352,000 acres in December 2010. Federal land leased in December 2011

totaled 32,000 acres, down from 358,000 acres in December 2010.

2012 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Fifty three drilling permits were issued, 42 wells were drilled, and two wells were plugged through December 6, 2012. All but three permits and wells drilled were stratigraphic tests for potash east of Holbrook. A permit is required from the Oil and Gas Conservation Commission for the potash stratigraphic wells because the holes penetrate the Coconino Sandstone, a potential helium reservoir in the area of the Petrified Forest National Park. Triomphe Energy out of St George, Utah, drilled an oil exploration well, the 1 Triomphe Fee, to a total depth of 4521 ft about 15 miles north of Holbrook. Triomphe Energy temporarily abandoned the well with plans to drill and test a lateral extension in 2013. Kinder Morgan drilled two wells, the 11-3-30 Fee and 11-25-30 Fee, to total depths of 2600 ft and 3027 ft, respectively, for carbon dioxide at the St. Johns Gas Unit. Kinder Morgan started drilling a lateral extension in its 10-5-30 State in December. Kinder Morgan was evaluating the results at year end.

Elm Ridge Exploration plugged the 1 Navajo well at the East Boundary Butte field in northeastern Arizona. Humble Oil & Refining Company completed the 1 Navajo in November 1955 as an oil well. It produced 147,883 barrels of oil and 2.1 billion cubic ft of natural gas before it was plugged in May 2012. Elm Ridge also plugged the 3 Navajo well at the East Boundary Butte field. Humble Oil & Refining Company completed the 3 Navajo in November 1969 as an oil well. It produced 59,474 barrels of oil, 620,892 barrels of water and 370 million cubic ft of natural gas before Merrion Oil & Gas Corporation converted it to a produced-water disposal well in June 1982. A total of 785,145 barrels of produced water was pumped back into the East Boundary butte field before it was plugged in May 2012. Holbrook Energy LLC submitted notice to plug and abandon its 35-1 Hortenstine in late 2006 but had not plugged the hole by yearend 2012. Holbrook Energy drilled the 35-1 Hortenstine as a helium test in the old Pinta Dome field in September 2004.

Oil production totaled 51,949 barrels from 21 producing wells in 2012, up from 36,925 barrels from 9 wells in 2011. Gas production totaled 116.6 million cubic feet from 4 producing gas wells, down from 168 million cubic feet from 5 wells in 2011. No CO₂ was produced in 2012. There were two active disposal wells and nine shut-in wells at yearend including 5 oil, 3 gas and 1 CO₂, well.

There are no oil and gas refineries in Arizona.

Liquefied petroleum gas (LPG) transferred in 2012 through storage wells near Phoenix and Holbrook included 190 million gallons in receipts and 175 million gallons in deliveries, as compared to 154 million gallons received and 160 million gallons delivered in 2011. About 76 million gallons of LPG were in storage at yearend, up from 61 million gallons in 2011. There are currently fourteen storage wells in subsurface salt near Phoenix and Holbrook. Plains LPG Services LP owns and operates the LPG facility near Phoenix. Enterprise Products owns and operates the LPG facility near Holbrook.

The Oil and Gas Conservation Commission held four regular meetings in 2012. Current commission members include J. Dale Nations, Tucson, Chairman; Stephen R. Cooper, Casa Grande; Frank Thorwald, Sun City; Robert L. Wagner, Mesa; and Vanessa Hickman, ex-officio member and State land Commissioner. Links to rules and statutes and other information about oil and gas in Arizona may be found on the Commission's web page at www.azogcc.az.gov.

There were 504,000 acres leased for oil and gas in Arizona at yearend 2012, down from the 511,000 acres at yearend 2011. Oil and gas leases on State Trust land totaled 477,000 acres in

December 2012, down from 479,000 acres in December 2011. Federal land leased in December 2012 totaled 27,000 acres, down from 32,000 acres in December 2011.

2013 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Forty seven drilling permits were issued and 30 wells were drilled in 2013. Three companies drilled 27 wells for potash in the area of Petrified Forest National Park east of Holbrook. Kinder Morgan drilled three wells for carbon dioxide in the St. Johns Gas Unit between St Johns and Springerville.

Twenty seven wells were drilled east of Holbrook for potash in 2013. Passport Potash drilled six wells at its potash project west of Petrified Forest National Park. HNZ Potash drilled the Mine Shaft Core Well #1 at its potash project southwest of Petrified Forest National Park. HNZ cored through the rocks overlying the salt to obtain information relative to eventual construction of a mining shaft. American West Potash drilled 20 wells at its potash project east of Petrified Forest national Park. American West Potash cored two of its holes from the surface to total depth to obtain information relative to eventual construction of a mining shaft. The Oil and Gas Conservation Commission required a permit for the potash stratigraphic wells because the holes penetrate the Coconino Sandstone, a potential helium reservoir in the area of the Petrified Forest National Park. The Little Colorado River Plateau Resource Conservation and Development Area, Inc. developed a potash information website to provide information about potash mining and the Holbrook Basin. See the new website at http://www.holbrookbasin.org/index.html.

Kinder Morgan tested several existing wells and drilled three new wells in the St Johns Gas Unit in 2013. Kinder Morgan plans to develop the St Johns Gas Unit as a major supplier of CO₂ for enhanced recovery. Kinder Morgan anticipates drilling up to 250 wells, building a pipeline and ultimately delivering 450 to 500 million cubic ft of gas a day to the Permian Basin by 2016. Ridgeway Arizona Oil Corporation drilled the discovery well for the CO₂ field in August 1994. The accompanying photograph shows a rig drilling one of the CO₂ wells in 1997

Oil production totaled 60,072 barrels from 25 producing wells in 2013, up from 51,949 barrels from 21 wells in 2012. Gas production totaled 71.9 million cubic feet from 5 producing gas wells, down from 116.6 million cubic feet from 4 wells in 2012. No CO₂ was produced in 2013. There were two active disposal wells and four shut-in wells at yearend including 1 oil, 2 gas and 1 CO₂, well.

There are no oil and gas refineries in Arizona.

Liquefied petroleum gas (LPG) transferred in 2013 through storage wells near Phoenix and Holbrook included 168 million gallons in receipts and 188 million gallons in deliveries, as compared to 190 million gallons received and 175 million gallons delivered in 2012. About 57 million gallons of LPG were in storage at yearend 2013, down from 76 million gallons in 2012. There are currently fourteen storage wells in subsurface salt near Phoenix and Holbrook. Plains LPG Services LP owns and operates the LPG facility near Phoenix. Enterprise Products owns and operates the LPG facility near Holbrook.

The Oil and Gas Conservation Commission held four regular meetings in 2013. Current commission members include J. Dale Nations, Tucson, Chairman; Stephen R. Cooper, Casa Grande; Frank Thorwald, Sun City; Robert L. Wagner, Mesa; and Vanessa Hickman, ex-officio member and State land Commissioner. Links to rules and statutes and other information about oil and gas in Arizona may be found on the Commission's web page at www.azogcc.az.gov.

There were 756,000 acres leased for oil and gas in Arizona at yearend 2013, up from the

504,000 acres at yearend 2012. Oil and gas leases on State Trust land totaled 716,000 acres in December 2013, up from 477,000 acres in December 2012. Federal land leased in December 2013 totaled 40,000 acres, down from 27,000 acres in December 2012.

2014 - By Steven L. Rauzi, Oil & Gas Program Administrator, Arizona Geological Survey

Eleven drilling permits were issued and seven wells were drilled in 2014. Kinder Morgan permitted six and drilled seven wells for carbon dioxide in the St. Johns Gas Unit between St Johns and Springerville. One of the wells that Kinder Morgan drilled was permitted in 2013. Ranger Development permitted two and drilled one well in the old helium producing area east of the petrified Forest National Park in the Holbrook Basin. Ranger is planning further tests in its well. Gusher State permitted two wells near Douglas and Leonard Hafley permitted one well near Kingman. Neither Gusher State nor Leonard Hafley have started drilling their permitted wells.

Oil production totaled 56,239 barrels from 19 producing wells in 2014, down from 60,072 barrels from 25 wells in 2013. Gas production totaled 105.6 million cubic feet from 6 producing gas wells in 2014, up from 71.9 million cubic feet from 5 wells in 2013. No CO₂ was produced in 2014. There were two active disposal wells and eight shut-in wells at yearend including 7 oil, 1 gas and 1 CO₂, well.

There are no oil and gas refineries in Arizona.

Liquefied petroleum gas (LPG) transferred in 2014 through storage wells near Phoenix and Holbrook included 183 million gallons in receipts and 153 million gallons in deliveries, as compared to 168 million gallons received and 188 million gallons delivered in 2013. About 70 million gallons of LPG were in storage at yearend 2014, up from 57 million gallons in 2013. There are currently fourteen storage wells in subsurface salt near Phoenix and Holbrook. Plains LPG Services LP owns and operates the LPG facility near Phoenix. Enterprise Products owns and operates the LPG facility near Holbrook.

The Oil and Gas Conservation Commission held two regular meetings in 2014. Current commission members include J. Dale Nations, Tucson, Chairman; Stephen R. Cooper, Casa Grande; Frank Thorwald, Sun City; Robert L. Wagner, Mesa; and State Land Commissioner, exofficio member and State land Commissioner. Links to rules and statutes and other information about oil and gas in Arizona may be found on the Commission's web page at www.azogcc.az.gov.

There were 894,000 acres leased for oil and gas in Arizona at yearend 2014, up from the 756,000 acres at yearend 2013. Oil and gas leases on State Trust land totaled 854,000 acres in December 2014, up from 716,000 acres in December 2013. Federal land leased in December 2014 totaled 40,000 acres, unchanged from 40,000 acres in December 2013.